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# THE BOSTON Medical and Surgical JOURNAL

Owned and Published by the MASSACHUSETTS MEDICAL SOCIETY

OFFICIAL ORGAN OF THE NEW ENGLAND SURGICAL SOCIETY, AND OF THE BOSTON SURGICAL SOCIETY, INC.

Volume 191, Number 7
$6 per Annum, 25c per Copy

THURSDAY, AUGUST 14, 1924

Published Weekly in Boston
at 126 Massachusetts Avenue


## CONTENTS


**MASSACHUSETTS MEDICAL SOCIETY**

SECTION OF MEDICINE

Product of Medical Education. *David L. Edsall* ..... 283
On the Treatment of Exophthalmic Goiter. *G. W. Holmes, J. H. Means, C. A. Porter, E. P. Richardson* and *M. P. Starr* ..... 295
Personal Observations in Hypertension. *Frederick R. Barnes* ..... 301
Clinical Aspects of Erythremia. *T. B. Futcher* ..... 304

**ORIGINAL ARTICLES**

Significance of Disturbances of Micturition. *George Gilbert Smith* ..... 311

**CASE RECORDS OF THE MASSACHUSETTS GENERAL HOSPITAL**

Cases 10331, 10332, 10333 ..... 316

**EDITORIAL DEPARTMENT**

Editorials, Book Reviews, News Items, etc. See next page.


For list of Officers of the Society for 1924-1925, see page x of the Advertising Section. For Officers of the District Medical Societies, see page x.


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# CONTENTS

*(Continued)*

AUGUST 14, 1924

EDITORIALS
New Race of Amazons? 32
Typhoid in the Lap of Nature 32

BOOK REVIEW
Culture of the Abdomen. F. A. Hornibrook 31

CORRESPONDENCE
Department of Public Health 325

CURRENT LITERATURE 32

MISCELLANY
Adjusted Compensation for Veterans of the World War 329
American Orthopsychiatric Association 331
Babies Are Safer in England 329
Connecticut Department of Health Weekly Morbidity Report—Week Ending August 2, 1924 325
Health of the Navy 329
Joint Committee on State and National Legislation 326
Massachusetts Department of Public Health. Diseases Reported Week Ending August 2, 1924 325
Medical Corps in the U. S. Veterans Bureau 326
Spread of Smallpox 331
Summary of Study Entitled "Adapting Nutrition Work to a Community" 327
Tax Assessments 328

OBITUARY
Robert Williamson Lovett 331


# Weed Hay Fever

THE Late Summer and Early Autumn Type of Hay Fever is caused by many of the common weeds, as—Ragweed, Russian Thistle, Sage Brush—the species differing widely according to locality. To assure specific treatment diagnostic tests are essential. To assure preseasonal treatment early diagnoses should be made,—otherwise the less desirable, though often beneficial, coseasonal treatment will be involved. List of late flowering weeds, showing regional distribution and time of pollination, sent on request.

GIANT RAGWEED *Ambrosia trifida*

RUSSIAN THISTLE *Salsola pestifer*

SAGE BRUSH *Artemisia tridentata*

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Yonkers, New York

THE BOSTON
Medical and Surgical
JOURNAL

VOLUME 191 AUGUST 14, 1924 NUMBER 7

# ORIGINAL ARTICLES

## The Massachusetts Medical Society

### Section of Medicine

Meeting at Swampscott, July 7, 1924

## THE PRODUCT OF MEDICAL EDUCATION*

BY DAVID L. EDSALL, M. D.

*Dean, The Harvard Medical School*

I WAS asked to discuss some of the features of medical education. Necessarily it must be very limited features, and as I suspect it was desired that I should do, I shall confine myself to a few points that relate to queries often made regarding the effectiveness for practise of the present day graduate in medicine.

I shall be obliged to touch but briefly and sometimes almost dogmatically upon these points in order not to trespass upon time. Any statements of fact that I may make, however, are, so far as I can learn, correct.

The queries I have in mind are sometimes friendly, sometimes critical. It is not surprising that they should be made when we reflect upon the extraordinary changes that have occurred in this country in the past three decades, but especially in the most recent half of that time, in medical education and in its product. I think no one who is at all familiar with the real effect of these changes can believe that the total result has been other than a very remarkable advance, whatever question there may be of some details. Previous to that time, there were many wretched or poor schools whose graduates brought down the average quality of physicians to such degree as to give a very unsatisfactory savor to medical conditions in general, in this country, amongst those who were familiar with what sound institutions in other parts of the world, and also here, could do and were doing. Within what is really a very brief period, such extensive improvements have occurred that there are now very few places left that are discreditable. Most schools produce conscientiously trained graduates, however imperfect they may be in some particulars. The conditions in a few states still permit a few really poor schools to continue as a blot on the local standards. Otherwise, they all meet now minimum standards of general education and of preliminary training in science that are very like those that had already developed in most other parts of the world where medical education was well advanced. They maintain, also, standards as to length of study of medicine and character of the medical course that compare favorably with other countries that have high standing in educational progress. The good schools, too, have been stimulated to maintain their supremacy by doing better than before, and one of the most satisfactory things of all is that amongst the best are now some that earlier were quite poor.

Let us first be clear on one point. Some persons appear to think that in the time now required for training in medicine, and in the severity of our courses, we have in our enthusiasm for reform gone beyond what is wise and reasonable, and by so largely increasing standards and extending the duration of required study, and by the consequent expense, we have so reduced the number of medical students that the supply of doctors has been endangered; that this largely explains the present unfortunate dearth of doctors in country regions; and that in general, also, it is now too difficult for those who have ability but only slight financial resources. Some of these persons—not many, I think—advocate, or come close to advocating, lessening of the time required, and of the severity of the course. I think it is unnecessary to delay long over this, but I would say first, that our standards represent not an extreme reached in a period of exaltation, but a tardy arrival at approximately the same standards that had already been reached by most other highly civilized countries, in nearly all of which financial conditions are much more difficult than here. The training differs, of course, in details. One of the most striking differences and one that gives rise to some misunderstanding is that in this country the basic sciences are taken by the student when registered in college, while in most other countries they are taken while registered as a medical student. The requirements in this country, then, include a certain period in college, and this gives

*An address delivered before the Section of Medicine, annual meeting of the Massachusetts Medical Society.

to some an impression, that is, however, a false impression, that we make a special and extra demand on the student before he enters medical study, a demand not made by other well developed countries. This is a purely technical difference, and the total time demanded is just about the same here as elsewhere. Many of our students, to be sure, voluntarily take more time in college than is demanded as a minimum, and this is one factor in making our average age at graduation older than it is in other countries, as a rule. Another important element in elevating our age at graduation is the fact that elementary and secondary schools, as well as colleges in this country, do not get the average boy to as advanced a point in training at almost any given age, as they do in many foreign countries. This, however, cannot be charged up against the medical demands, but is a distinct and separate and larger general question in education.

Secondly, I would say that those who have studied the point from various angles do not find evidence that there is now or is impending a lack of sufficient numbers of doctors, but they do find that there is an unsatisfactory distribution of them. Some persons who have studied the point even think that there may soon be an excess of doctors, though I think that is not clear.

Thirdly, reducing medical standards would not cure the faulty distribution of doctors, unless those who are briefly and badly trained went especially to the country regions, and there is no evidence that they have done this extensively, or would do it. It is, on the other hand, obvious that this would be a highly unintelligent way of meeting the need for doctors in the country regions, and would be clearly recognized as such by intelligent people who employ them, and would be resented. The reasons that country practise does not attract doctors sufficiently are other than these, and must be met in other ways.

The expense of medical education is a serious matter, very serious to both institutions and students. Again, the intelligent way of meeting this is not to reduce standards and thereby degrade the kind of service rendered the public. It does not now exclude poor boys. In the school with which I am connected, and in most others that I have learned about there are at least 40 to 50% of the students who require and who secure some of the funds necessary for their expenses during their training through either their own work during the summer or during the school year or through scholarships or loans. The tax on them is now sometimes unduly severe for their health and to some degree interferes at times with their proper scholarly progress. It is desirable that methods of relieving the strain on them be increased and made more effective, and particularly that methods be devised of helping them to secure the necessary funds in other ways than through work which has no developmental advantages to them, and is sometimes very trying in its character. Efforts are constantly being made to accomplish these things. They are here slowly improving, and I think they are elsewhere.

A further question that is in certain ways a much more thoughtful one, though in its bald form is not wholly informed, is whether the medical student has now too much science in his training and view point and too little cultural training. In part this depends upon a common lack of knowledge as to what the actual minimal requirement in the basic sciences really means. The total time spent in meeting the minimal requirements in these subjects is the time spent by the usual student in only one year in college. It is, to be sure, not feasible to secure the several laboratory courses needed actually within one college year, because the course in organic chemistry necessarily follows that in general chemistry, and because, also, to attempt to take all the required science in one year would crowd an impossible amount of laboratory work together. Nevertheless, the time spent in these courses totals the value of one complete college year. That is not a forbidding amount of time for a student to put into the subjects upon which any educated comprehension of natural phenomena depends, upon which, also, the profession that his life will be given to has been largely built, and upon which medicine now depends, both for its present knowledge and for future progress, far more than it did even a few years back. One can scarcely feel, then, that amount of time to be at all unreasonable for that purpose. Nor should it interfere at all with general cultural development, not simply because this requirement does absorb an undue amount of time for the sciences and away from other things, but because nothing has a higher actual cultural value than proper training in the principles of science. The old idea that the study of science is on an inferior intellectual plane as compared with the "humanities" still appears in some arguments, but no longer has any real standing. Many men do take much more than the minimum requirements in science, but this is by their own choice and they should be not only permitted but encouraged to exercise their own judgment to a large degree and to develop their natural interests to a point that gives them some power in scholarship. At any rate, their making such a choice cannot be used as an accusation against the actual demands for such a qualification.

I do have sympathy, however, with the feeling that the requirements are too schematic and rigid as to doing certain precise things in certain ways, in certain sequence, in definite courses of a definite character and for a definite length of time. There is a fair criticism as to this point to be made of the requirements as they stand at present not only in the premedical but also in

the medical sciences. The same criticism can be made to a considerable degree of the requirements in the clinical years.

It should be clear that this is a part, not simply of the system of medical education, but of a general system of education that is almost peculiarly American and that presents probably a greater need of reform than any other large feature of our methods of education. It is a system in which judgment as to a man's training is built primarily upon time and course credits rather than primarily upon his knowledge. Because of its entrenched position in our secondary schools and colleges, because also of a general habit of thought that this has brought about in this country, this system was the most obvious and perhaps a necessary method of establishing effective checks in standards during a period of imperatively important reform and elevation of standards. With evil conditions essentially past, however, the method is impairing progress and it particularly impairs individuality in institutions as well as in students. A considerable flexibility in a number of ways into which I cannot profitably attempt to go in the brief time at my disposal, is not only feasible but desirable, and would not lower standards but improve them. Men should be accepted more in accordance with their knowledge and less in accordance with the process that they have gone through and the circumstances under which they have gone through it. They should also have more freedom as to precisely what the individual must know in detail rather than in principle when he enters medicine. As I said, I do not fear that they get too much science. With the present minimum, they get now only a very elementary knowledge of any one of the sciences. It would be better to encourage proficiency in some one or more of the sciences, and if a man showed distinct advanced progress and proficiency in one science and a reasonable comprehension of the principles and of the pertinent facts and methods of the other sciences, but had some relatively slight deficiency in them, the real proficiency in one line should offset the latter.

During the medical course, itself, in both the medical sciences and in the clinical subjects, without lessening the total, there should be distinctly more flexibility as to the precise time and effort demanded in each of the individual subjects, and there should be much greater freedom in the sequence in which the student may take them. Capable students could then make distinctly advanced and independent effort along some one fundamental line of study in which their interests and capacities lie, and could thereby gain more power and confidence in some one field of knowledge, and thus gain the mental development that comes with informed confidence. Let me make it clear that what I said in no way means training a man in a special line of practise during his medical course. To do that is wholly deplorable; I mean training a man in power of scholarship and of independent mental effort and judgment.

This would also give the opportunity, and indeed the responsibility, to the students of choosing for themselves to a noteworthy extent, what they will do with their time in course and how they will do it.

This, I am sure, is one of the most serious defects in our system, and one not sufficiently often appreciated. One of the most justified criticisms of the present day graduate is that very often he lacks initiative and independent and practiced judgment. I am not at all ready to say that he is more defective in this way than earlier graduates. We easily forget how very defective we were ourselves at that stage. But I do believe he is more defective than he would be if we had a less schematic system, a system that gave more outlet to the individual's own powers of work and decision, that supervised him, not less accurately but less obviously, and that threw more responsibility on him instead of taking responsibility from him to a large degree by making it necessary for the most part for each man to do what each other man does, each in the same way and in the way not chosen by him at all, but prescribed for him.

Medical education, again, is not peculiarly at fault in this point, but has simply carried on in the more mature work, methods employed in the earlier education and unfortunately employed in this country more than in other countries. Whatever may be done as regards earlier education, it is clearly desirable to make professional education tend to develop judgment, initiative, and decision. There is a fearfulness on the part of some teachers and of many other persons, of giving the student much freedom of thought or action, that is extremely common in this country, particularly when one compares it with what has been done and is being done in other countries on this point. It is difficult to see why there should be such fear of it, such dread of bad results, when we reflect upon experience elsewhere. Many teachers wish to establish more freedom; indeed, I think the large majority now do, and freedom is distinctly increasing recently. Regulations, however, have developed on the basis of the traditional view point that very largely restrict attempts to make more freedom, and it is, therefore, necessary not only to reach a new view point but to go back and reorganize regulations in order to permit progress in this particular. There is every indication, I think, that this will come about. It is, of course, important that it should not be so hurriedly and hastily and extensively carried out as to lead either to confusion or a lowering of standards, or to throwing on their own resources, students unaccustomed to this to such an extent as to lead them to ineffectual effort. I have seen the latter occur to such an

extent in some foreign countries that I am clear in my mind that over-supervision and over-regulation produce a better result than too little of these; but the supervision should be sufficiently reduced and sufficiently altered in character to give more opportunity for the development of initiative and independence.

Another point that I would touch upon, but with some hesitation and reluctance, is comprised, to put it briefly, in the occasional complaint that the recent graduate is "too scientific." I am reluctant to take this up, because it is often a little difficult to understand what is meant by it; and also it is clearly so illogical as hardly to need to excite an argument to say that one can be too scientific, if one used this term in its true sense. In a profession in which training in the securing of accurate data, in weighing the value of evidence, and in solving problems is training for the things that are the daily activities of practise, power of this sort is the essence of real success in elucidating the constant problems of diagnosis and treatment. Sometimes this criticism means only that the critic objects to things that he is ignorant of, and hence cannot understand. This is only occasionally true, however. That point of view is not uncommon in all activities of life, and has no particular effect excepting occasional success in causing obstruction. One occasionally hears the remark that recent graduates "talk about things which we cannot follow." I think we all have those irritating experiences, but we must reflect that this is not less likely to be a criticism of those of us who are older, than of those who are coming on. The knowledge upon which medicine depends is being added to with extraordinary speed, and a few years of routine readily leave one ignorant of seriously important things, unless intense effort is made in keeping pace.

But having been thus severe upon a small group of those who comment in this way, we may say that the criticism more frequently means that some recent graduates have been met who have a conglomerate of information and of technique relating to the sciences which they cannot use very effectually to illuminate their work, the rationale of which in relation to their life effort they do not really comprehend. This, unfortunately, is sometimes true, but such a man is not "too scientifically" trained. He is too unscientifically trained. It means that some students, either spontaneously or under the influence of some of their teachers, have proceeded under the mistaken assumption that an accumulation of facts and of technique constitutes a scientific training.

It is a new thing in education to find occasionally such a result, nor is it an accusation against the spirit of the present method. It is rather an evidence that some students and some teachers fail to grasp the real purpose of their endeavor. It is not peculiar to training in science nor to the laboratory element of that training. It will continue to occur in a certain proportion of cases, and in all forms of training until super teachers and super students prevail. I would agree, however, that there is a rather peculiar tendency for this to come about in a medical training because of the almost appalling rate at which highly important new information and new technique have been accumulating in recent years in medicine and in the subjects upon which it is built. It requires excellent judgment and constant self criticism under such circumstances, to avoid requiring such an accumulation of information and such a multiplication of experiences in technique, that the very purpose of these things is defeated, and they befog as much as they illuminate. With the very rapid development of present methods in the past couple of decades, this has sometimes happened. It sometimes still happens. Some enthusiastic persons have proceeded as if the present methods were not only a broad highway to knowledge but the Royal Road. Also, 10 to 15 years ago, there were here and there decided examples of extreme thought in relation to the character of scientific information that was needed. It was then not uncommon to hear the argument that any attention to the practical relations of the medical sciences, that any departure from the abstract spirit in teaching them, led to their degradation and prostitution. Some of this persists, but only a little of it, and only occasionally. It has largely passed. The trend, indeed, is too far the other way at present. Now, some extremists who are vocal are pressing for such an extensive infiltration of the directly practical into the medical sciences as would almost undoubtedly lead to their degradation and thereby do great damage to the progress of medicine, but would also add to the student's confusion. This too will pass, and though the pendulum will not come to rest, its swing will be less as the mechanism is improved.

But the teachers as a group, are the severest critics of their own work, and there is no sign that they are dangerously complaisant though the results are not perfect and are not free from just criticism in some ways. They are vastly better than they were a comparatively short time ago, not only in that the student is far better informed than he was in the medical sciences, but he is much more capable of making intelligent use of their relations to practical medicine. The effort to bring them into intimate and illuminating relation with practical matters has, I am sure, been more extensive, and I believe distinctly more successful, in this country than in other countries in which I have observed conditions. Since the introduction at the Harvard Medical School of a final general examination, which obliges the men to display in relation to clinical problems the knowledge that they have

gained in any of the courses, coördinated in its bearing upon clinical problems at hand, we have had excellent opportunity to judge of this. The results are sincerely gratifying as contrasted with the previous conditions during the 30 years that I have known something about them. The effect of such an examination habituates the student throughout his course to coördinate toward the ultimate result. It also habituates the teachers to that view point.

My surgical friends will hasten to say that what I have stated is not true in regard to anatomy, that the usual present day graduate knows less anatomy in relation to operative surgery than he did in earlier years. Perhaps he does, but—my hat is in the ring—he should. He should, that is if he is preparing himself in the time at his disposal, to be effectively trained for general medicine. Anatomy, like other things in the course, should be taught in the general course not with the specialist in view but with the general practitioner in view. If the individual desires to do special practise such as surgery, he should prepare for it in anatomy as in other ways, in suitable, special study. The surgical view point has from the beginning largely dominated the teaching of anatomy in the general course, and from that view point the character of anatomical knowledge now gained is relatively less satisfactory, but recently anatomy is becoming more adjusted to general interests and necessarily the intensity of concentration on special interests is lessened.

There has been in recent years an extremely extensive development of student work in the laboratory. This is in principle highly desirable, and in the aims and character of it as it is done in most laboratories and especially in certain subjects, it is admirable and wholly an advance. An acquaintance with the methods by which knowledge is gained sufficient to illuminate study of a subject and to give some degree of judgment as to the soundness of new contributions, is essential, if men are to avoid slipping back into the old and dangerous methods of speculation that for so long dominated medical practise. Actual skill also in such methods as can be usefully employed in practise, is essential. Such facts likewise as are necessary for any educated person in reaching a sound elementary comprehension of a science, and such further facts as will illuminate the medical man's later progress in his work, are equally desirable. It is an extremely narrow, and a wholly erroneous attitude, to feel that such things should be taught simply from the standpoint of what is obviously practically useful. That gives only a confused and distorted knowledge of the present condition of any subject and it gives the student absolutely no background upon which to comprehend the things that will be discovered in the coming years of his activities.

But when given in the desirable way, the details necessary are many, both in facts and in technique, and they leave little enough opportunity to inculcate the more important thing, a broad rational, philosophical conception of the illumination they throw upon intelligent prosecution of the work that the usual student will later do. It is undeniable that in all forms of teaching, the common danger is to force the student into such an accumulation of facts and experiences that the rationale of it all is overlarded and the principles that guide one through the facts are lost. It is true that sometimes it seems to have been felt that the laboratory is an open sesame, and it is forgotten that over feeding can happen with laboratory teaching as with any other. The students we have come from very diverse regions. I repeatedly meet with instances in which either in the premedical or medical subjects or in both, there has been chiefly an accumulation of facts and technique and only a limited understanding of principles. This particularly happens in certain subjects. The purpose of experience in the laboratory—to help them comprehend the subject—has in such cases been often to some degree directly defeated by the methods used in the laboratory. The same thing is true of the clinical subjects, not infrequently, also. Too many facts and methods have been accumulated, and the way through them is seen only unclearly. But while this is true, it is only occasional and is not the prevailing thing, and it is not a new defect nor is it due to present methods. It is only the expression in present methods of what has always been true of some teachers and some students.

Finally, let me take up the most important remaining query or doubt that one hears expressed, or rather two things in one. Granting, as is beyond question, that the present day graduate is better trained in his scientific background, and more capable of using this in practical ways, is he actually better trained in the definite, practical things that he must know as a dependable practitioner, and also does he possess as much skill and experience in dealing with human beings. These together largely constitute what is often spoken of as the art of medicine, something that is at times a bit sneered at by those of formulistic scientific temperament. The use of the word art for this kind of skill should not carry the thought of an impressionistic method that that word is often used to connote. Skill of this kind means rather thoughtful and informed and effective methods of providing bodily and mental comfort. It means often especially the ability to take off people's minds and bodies those loads that are not very definable or measurable, but that often determine the difference between health and unhealth, or even at times between life and death.

In part, the above question can be answered promptly and positively. In physical examina-

tion, in diagnosis, in general methods of careful study of serious disease, and in the methods of accurate study of mild disease, the present graduate is very much better prepared than he ever was before. He has had (what I think is rarely appreciated, excepting by medical teachers) easily four times as much practical training and experience in the medical course as was usually the case at the time that I graduated in medicine, and for a long time after. The amount in most places has still been increasing in recent years. In addition to this, many more men now take a hospital internship than formerly. Now, whether this is or is not required by local regulations, practically all medical graduates have such experience. So far as I have been able to determine, the practical training of the graduate in this country is now in toto at the time of his graduation, as extensive as in any country, and it is larger than in most. When he leaves his internship, the average beginning practitioner in this country has, I think, decidedly more experience in and is more highly trained in practical matters than the average in any other country that I know, and particularly because the internship is a more common thing here than elsewhere. He is then, I believe, sounder and safer.

But there is another side of this. He has, in relation to his future, had a somewhat unnaturally distributed experience. It will have been usually largely in serious disease, a good deal of it in what is really advanced or terminal chronic disease. He will have seen much less of acute and chronic undefined disorders or of mild acute disease or of the earlier stages of chronic disease. I do not think he sees less of them in actual amount than he used to, in fact I think he sees more, because the total amount of his clinical experience has been so much increased over what it used to be. But, nevertheless, he sees more of the serious things than he does of the milder, and he sees them under conditions that tend to more careful study of them, and because of this and because of their seriousness and importance, they both dominate the situation to a large extent and they interest him more and excite his attention more.

This has not been deliberately arranged. It occurs largely because our practical teaching is done almost entirely in hospitals and chiefly in the wards of hospitals. There have also been some decided changes in hospitals that have made this situation become more emphatic than it would otherwise have been, and more emphatic than is always clearly realized. Certain highly important diseases, tuberculosis, for example, are of course now unusual in hospital wards; more important than this but less dwelt upon, hospital wards have become increasingly places for serious acute disease and for the diagnosis and treatment of grave or obscure and difficult chronic disease. This long since was more true than was desirable in some lines. In surgery, for example, both what was offered to the student and his own natural tendency to seek the more exciting things has always led to his seeing an unduly large proportion of serious surgical conditions which will, with most men, play but a relatively small part in their lives subsequently. Further, in recent times, technical and in some cases elaborate and relatively difficult methods of study have rapidly multiplied. These and specialized expert training in particular lines have become of extreme value in large numbers of cases. It is of great importance that the student should become familiar with their value, skilful in the use of those that are feasible for him to employ and clear in his judgment as to when the more complex methods and the specialist in them should be brought in. But cases requiring such methods now constitute a large part of the usual ward service in an important hospital, and together with terminal cases or cases of very serious or of chronic disease, constitute most of the material in hospital wards. This, relatively, has peculiarly affected the conditions in clinical medicine. The methods of study of even difficult cases in clinical medicine were really exceedingly simple (as well as often ineffectual) until about a quarter of a century ago, since when they have become increasingly diverse and often difficult.

It is safer, without doubt, to have young practitioners well trained in thorough and accurate methods of study and well trained in meeting their responsibilities in serious disease, even if they be less highly developed in their knowledge of less dangerous conditions, than it is to have the contrary. Also on the ground work of the former, they can more readily develop their powers in the latter than they can do the contrary. When a student graduates, he has but just begun to learn, and it is futile to expect any course to produce a finished practitioner. I do not, therefore, at all deplore the fact that he is better trained in serious things and in accurate methods of study than in anything else, because this is the essential ground work of his future activities and with this he is far more likely to overcome his difficulties through experience than he is if the contrary were the case. We have to remember that the term "commencement," as it is applied in this country to the termination of a man's period in college, has a striking significance and one that is equally applicable to the time of his graduation in medicine—it marks, namely, the beginning not only of his independent work for a livelihood but also of his independent and unsupervised work to fit himself increasingly for his life's effort.

Nevertheless, I do not believe that present conditions are satisfactory. The undefined and the mild conditions, early chronic disease, and the like, will constitute his chief work always, and especially in his early practise. They are

the most difficult of all to achieve real skill in. It is proper that he should approach them with previously gained confidence and power through study of the things that are more demonstrable and more definable, but I do not think that he now gets as much training in the milder things as he should have, either in his course in medicine or in the usual hospital internship. The latter period should be even more decidedly emphasized in this connection than the former, for it is in his period as hospital intern, as his training is now done and as it will undoubtedly continue to be done in this country, that we ought to be able to give him a particularly good ground work for his practical activities.

The most obvious and the most effective way of doing this is through greater use of the out patient department with both students and interns. There the conditions under discussion are found in numbers. To make this successful, however, out patient departments must be given a different status. Often the interns have been used in them little if at all, and when they have been used, it has too often been chiefly to take off the trying routine from the shoulders of the staff, and the intern gets in such cases too little supervision and too little opportunity for careful, thorough and intelligent study or guidance. Too often the work itself is looked upon by the staff as undesirable and inferior and is carried on very largely in the hope that they will advance to the coveted opportunities in the wards. It has been largely in the hands of junior men. The department heads and other men of advanced position usually throw off this work almost completely as soon as they can, although it is often highly difficult work, in some ways more difficult than that in the wards. To be well done, and particularly for teaching to be well done, there, the senior men must to some extent go back into the out patient department and take some active part in it and its guidance. It is equally important that out patient departments be so managed that the work is not the mere routine of handling the sick. Opportunities must be developed for careful and contributory study of disease there. Not only will this aid in the improvement of the young practitioners, it will also aid greatly in very desirable studies of early disease and in real service to the patients. One of the first necessities, I believe, if this is to be done successfully is to restrict the number of patients seen in the out patient department to the number that can be carefully studied by the staff available just as is done in the wards.

What has just been discussed is a partial answer to the question whether the present day man enters into practise as well developed in the art, so-called, of medicine, as he should be. I do not think he does. I must at once add that I do not think he ever will be really skilful in this, at that time. In its true form, this is a singularly impressive coincident development in information and in adeptness, and it is not only one of the most enviable and valuable qualities of the able, experienced practitioner, it is also probably the one that is most slowly acquired. It is sometimes spoken of as if it were simply a natural gift. In its best examples it is in part gift, but even then by no means entirely so. I would refer those who think it is purely a gift to Florence Nightingale's pungent remarks about the nurse who is "born not made." On the contrary, it is only those who have rare natural gift, who will develop it well spontaneously. Most persons who acquire it will need to have their faculties stimulated by those who are already masters of the art, and their practise of it must usually be guided through early blundering before they are fit to develop skill independently, just as is true of the fine arts or of the applied sciences or of other highly trained activities.

So considerable an amount of this aspect of clinical skill is incapable of being transmitted by written record, so much also is empiricism of the finer sort, that it is often said that it cannot be taught. But the peculiar qualities of the work of real masters of the fine arts are likewise not capable of written transmission, and are in large part empirical. Nevertheless, men who become masters of these are well recognized to have been commonly pupils of older masters, they have always sought such training and they attribute much of their skill to it. It is the same with medicine. The discussion of clinical teaching, occasionally even by teachers, at times overlooks this, with quite sincere intent, but it seems to me altogether theoretically and unwisely.

Earlier teaching had frequently an unduly large proportion of this feature and an unduly small proportion of those elements and methods that are measurable and that fix first in the mind accuracy and thoroughness and self criticism. The latter are often comparatively irksome, especially to eager youth, and their value to many minds is less obvious, but it is far safer to lean heavily upon them at first. Art is so blundering unless based upon knowledge and so readily becomes artifice if practised without a well developed critical faculty.

Just as they influence the general character of clinical training, the hospital conditions that I have mentioned influence the especial element of that training that is now before us. Such types of cases as chiefly fill hospital wards are not those that largely bring out this training in either teacher or pupil. Hospital wards are for another reason far from being completely suitable for such training. They are highly organized, as they should be and must be to accomplish their purpose well. Nurses are always at hand to provide at the physicians' mere order the details of care, of restfulness, and of

relief from discomfort that the practitioner must know in detail and describe accurately, and not infrequently do himself, in the home. Equipment of diverse kinds is ever at hand, in the hospital. Chiefs, assistants, and interns do conjointly there even the technically medical things in examination and treatment that the practitioner does entire. Specialists take over much of the serious judgment and action in diagnosis and treatment in a hospital. Furthermore, imperative things of highly concrete character necessarily dominate the hospital situation. Intimate social, psychological, or financial domestic situations fade into the background there, even with the patient. They are, indeed, in many details impossible of elicitation in the hospital. Also, continued and seasoned knowledge of the individual patient and his family scarcely occurs there. But though in themselves and in their influence, often not very concrete, and not very immediate in their imperativeness, these constitute a very large share of the essential things that the practitioner deals with in the management and the prevention of disordered health and actual disease.

Many of you will be thinking, "he says an undisputed thing in such a solemn way." It is not quite undisputed, however. Those who are not clinicians not very uncommonly think that the practitioner can easily "pick this up" if he is soundly trained. A few clinicians without much experience of it assent to this. Persons who think so usually recognize only the superficial aspects of the matter and often even confuse it with mere impressionistic style.

It can be better inculcated in the out patient department work than in the wards, a further reason for somewhat larger use of the former than has been the case. But even this is nearer to hospital ward conditions than to the conditions of practise. The patient's disorders there are more normally distributed in character, the factors producing them are more truly a picture of the factors that in general derange health. But not wholly so. We do not meet there a cross section of humanity and of the elements in its life. The organization there is a less emphatically dominant feature but it is still dominant. There is little continued or connected knowledge of the patient or of his kin. Some of these things are greatly bettered by an effective social service department. Knowledge gained through the social service department, however, as this is usually carried out, comes to the physician second hand through others, and the management based thereon is likewise mostly administered by others.

How then shall the student best get his elementary conceptions and guidance in the art of medicine? In Switzerland, home visiting in company with the home physician, who is also an official teacher in the medical school, is now being used somewhat as a part of the course in a form sharply reminiscent of the old apprentice system. In certain other places, the student visits and prescribes treatment for people in their own homes with little or no supervision, a practise highly questionable in its effect on both student and patient. In this country in several places the student gains something of this training, though only a part, from a little experience in the home in association with the social service. It is rather probable that some development of a sort such as these will become an established feature of the course, but it must be rather slight in amount or the disorganization it would produce and the time consumed would make the effect on the whole harmful.

The main way in which this must still be done is through giving the student frequent contact with able teachers who have gained this skill and who retain it through continued experience and practise, men whose positions in the department are sufficiently dignified to lend interest and authority to their teaching. Some of them, indeed, must be of such standing and ability that their services would not be available in distinctly inferior stations. In this point we must, too, have the intern more clearly in mind. The student can get some of this but never a great deal. An extensive intern service is happily, however, really part of our scheme of training everywhere, whether required or not, and in this period of training, provision for development in the art of practise can be made more extensively than with the undergraduate student, and more extensively than is now the case. This must be held in mind in arranging the character of the hospital staff and the character of the intern's work. It will not surprise me if a touch of the apprentice system penetrated definitely into the intern experience.

We must then in both the medical sciences and in the clinical branches do a very much more complex and difficult thing than before, and under circumstances that have grown more complex and difficult. It is not surprising, then, if trials are made of some things that prove unsatisfactory, even though the whole result shows great progress. We must provide nowadays for the new methods and the new atmosphere that have come into both preclinical and clinical work with such speed, and we must still hold fast to the established old. We must also provide for further progress. It is sometimes forgotten that the student must be so prepared that he will be able to take up his duties intelligently, but so prepared also that he will be capable of keeping pace himself, later, with the further rapid changes that are certainly coming within his career. Otherwise, he will become fossilized in a decade or two. He must have a setting that makes it easy for him to not only hold his ground, but to move forward.

And for the latter purpose, it is essential to have actual research in the atmosphere of the

school. He must habitually "look forward, not backward." Only a rarely gifted man will do this unless those who mould his viewpoint look forward eagerly. But not for this alone must research be fostered in a teaching institution. Most teachers, themselves, become poor teachers soon, unless they have continued experience on the firing line. The "practical man" is often fearful of the influence of teachers who are much engaged in research. To be so enamored of research that teaching becomes only an irksome but necessary task, usually makes in fact a very ineffective teacher. That sometimes but not often occurs. Even then, however, the teacher at least retains the stimulating qualities that accompany search for the unknown. More commonly, however, the teacher is forced into being so engaged in the routine of teaching that his own progress is hampered, his enthusiasm fades, and his effectiveness suffers still more. In such case he comes to lack stimulating qualities, from whatever source.

And with students of such maturity that they are about to enter their life work, contact with the methods of research which are the methods of attack upon problems, is an element of direct training for practise. For practise is, itself, a constant succession of problems, and this element is not to be feared, but is greatly to be desired, because of its influence in forming sound methods of thought and in eliminating the tendency to loose speculation. The more gifted students who can accomplish the required work with ease, can in fact do nothing better than to spend some part of their spare time over the investigation of a simple problem, not in order to appear in print, but in order to train their minds in methods of accurate self questioning and analysis, in search of the literature, and in judgment regarding the hypotheses that they themselves and others will be constantly bringing forward in practise. Abstract matters in research are of course suitable for few of them, only for that small number whose future powers lie that way.

With such diverse purpose, errors naturally occur along the way, especially when the whole atmosphere as well as many details have been subjected to very rapid but very necessary change. The most recent decided changes have been in the most practical divisions of medical education, in the clinical branches. These changes have aroused much discussion and controversy, but out of them has come great improvement. Though this matter is not yet sufficiently stabilized to make apparent exactly what the prevailing result will be, it is evident that the heads of important clinical departments and a group of assistants will in future in increasing numbers devote their energies and interests to their educational work, and that departments where this is done will far outdo those that have not come to it. This is sufficiently apparent already to make it possible to speak with confidence of it. It is obvious with us in that the students, in their elective work, if there is one department that is, and another that is not on an advanced academic basis, have largely preferred the former. The traditional plan of carrying both the major guidance of a great clinical department and an important practise is, I quite believe, about to be only a tradition. Scarcely anyone who has had experience with the present needs has any real doubt that with teaching and the organization of teaching; with the responsibility constantly for scores of seriously ill patients in the hospital and for the management of a large division of the hospital; with the fostering of research; with committee and other school work on his shoulders, the head of such a department will do some or all of these things badly, unless nothing obstructs their right of way and nothing else takes much time. A group of assistants also must be in the same relation to their work, both to make possible their own scholarly and pedagogic progress, and in order to spare the chief from entire confinement to administrative work and routine. With the duties such as they are now, the latter tends to occur all too readily, and the head of the clinic must be guarded against this more than has been done. There is a not uncommon impression that this life offers relative ease and freedom. On the contrary, it makes heavy routine burdens and the diversities and human relations of active practise on the one hand, or the relative intellectual independence of the preclinical branches on the other, offer large counter attractions to any, whether they be seniors or juniors, except those whose hearts are in clinical teaching and investigation.

Controversy has raged most warmly over the question whether these men may see private patients for pay, but the controversy has, as is often the case, centered about the less rather than the more important matter. Everyone with any breadth of view agrees, I think, that these men should see a limited number of patients of the class that can pay, both in order that such patients may not be wholly denied the special expert skill that these men develop and in order that the men themselves shall not have their development and usefulness as teachers and investigators deformed by lack of continued knowledge of the types of disorders and disease, the types of causes, and of management of these that such patients exhibit, as the usual hospital patients do not. In any case, however, this must be so arranged that it is only a fraction of their work, and a fraction of only such size as most effectively to aid in the forceful conduct of their academic work. That means so limited a fraction that such positions will not attract any except those whose dominating interests are academic. Whether they receive fees or not on either plan, properly arranged, they will do about the

same sort and amount of work with private patients. Those persons who would forbid acceptance of fees, put the fees into the general funds and give larger salaries, in the fear that the men will exploit their positions if they take money. Those who permit the acceptance of fees, believe that what has just been mentioned is rather a chimerical fear, that there is quite as much danger that on the other system the institutions will consciously or unconsciously exploit the men, and particularly that acceptance of complete personal responsibility in the usual and natural way with a few private patients in a hospital is much more effective in achieving the academic purpose in seeing such patients, than is the method that makes it purely a part of the duties to an institutional organization. The latter point appears to me to be a wholly adequate reason for adhering to the somewhat freer system. Skill in practise is not only gained slowly, it is lost readily. It is retained not by practise only, but by undivided and keen responsibility in practise. Circumstances, not regulations, have led me through all stages of experience in this. I for some time did general practise, then for a long time only consulting practise, then a distinctly restricted consulting practise, then none. I believe, I trust with reason, that I became better as a consultant as I went on, but I am sure I became coincidently less and less skilful in the duties of family practise. Then in the several years in which other duties grew so pressing that consulting work, though continued, became in considerable degree a task rather than a highly interesting and alluring thing, I could clearly see that my skill, such as it was, decreased, not simply as a consultant, but even in teaching and research. I imagine that this is usual. One develops, holds, loses and regains things, as one's mind grasps them with zest or turns away from them to other interests. I have often seen this same kind of skill fail to develop in able young men with a long training in hospital, until they got the vision of its effectiveness and interest through having had even a little experience of personal and sole responsibility, and of the human intimacy that comes from seeing patients because they seek you, not an institution, and of the power that comes from this. Once gained, not much of it needs to be continued to retain sound teaching ability. Some, I think, does, if the teacher is to balance things properly in the organization and conduct of either teaching or research. He will lose details even then, and he must retain in his group some who continue chiefly to practise, but unless he retains some of this faculty himself, the atmosphere will, I believe, tend toward the exotic. Some persons consider that this is not true, but I should prefer not to take the chance, unless some serious advantage can be demonstrated in the other method, and that has not thus far been the case.

I have exposed to you the questions that seem to occur most to the minds of those who have sincere interest in medical education but are not engaged in it, as well as the way that these things appear to some who are thus engaged. I, of course, make no claim to originality in any of these views, nor are the things discussed things that ought to be done but have not been properly weighed and acted upon by medical educators in general. All these questions are and have been in the minds of many educators. All those things that appear clearly to be defects they see and strive to overcome. Some things that others may call defects, they rightly or wrongly feel are not such, and some of these they think are actual advantages. In some things they differ among themselves, and it is always well that this should be true. The structure is greatly changed. It is, in the large, vastly improved. It needs some adjustment still, and there will always be necessary a readiness on the part of those who guide it to believe that it is not perfect and that a still better result can be attained.

Discussion: Dr. Stephen Rushmore, Boston: Dr. Edsall's very comprehensive paper is of extreme interest. He has covered so much that it will be impossible to discuss the paper in any fullness, and I shall mention only two or three points which I think ought to be particularly emphasized. At the risk of being misunderstood I am going to take the position of one who criticises adversely the present system of medical education. There are many things in the present day system of great value. There are certain respects in which I think the system defective. In the brief discussion it will be impossible to balance the good against the evil, and I shall appear to over-emphasize the defects.

In October, 1920, there was appointed a committee of the medical faculty of Columbia University, "to study the ways and means of improving medical education with special reference to the College of Physicians and Surgeons." This committee had, as consultant, W. H. Kilpatrick, Professor of the Philosophy of Education in Teachers' College, who held himself responsible for the soundness of the principles laid down in accordance with which the program was written. The report has not been published, as far as I am aware, but it has been circulated privately.

The committee formulated three fundamental laws of learning, the law of readiness, the law of effect, and the law of exercise. By the law of readiness is meant that the primary desire of the student to learn about disease and how to treat it, "sets" the student's attention. If he is not permitted from the first to keep this goal in sight, other motives irrelevant to his object enter, and vital interest flags.

By the law of effect is meant that it is necessary to maintain in the student a reaction of

satisfaction toward his work. This is attained in maximum degree, only when the knowledge required has a direct and pertinent bearing on the subject for which the student is set or ready.

By the law of exercise is meant that repetition, which is necessary, should be planned to exhibit the natural connections of each topic with other similar topics.

Substantially that is their report, not exact in detail.

With that in mind, what did they say about the teaching at the College of Physicians and Surgeons? This Class A School may be regarded as typical of the best medical schools in this country. What was said at that time, 1920, probably applies now, if it applied then. They said that the fundamental laws of learning were disregarded. Very little attention was paid to the fundamental principles. Perhaps because of what the Committee said, in the next year, President Butler of Columbia stated in his annual report to the trustees that medical education was fifty years behind education in other branches. I think if he said it was a hundred years behind, he might not have been unfair in some respects. But that was his statement—"fifty years behind education in some other branches."

Now the report and that statement by President Butler are a challenge to present day medical education—either it ought to justify its procedures or it ought to change them.

If we consider any educational scheme, there are four factors to which we ought to direct our attention. The first one is the aim. The second is the material to run through the educational "machine." The third is the educational process itself which consists of two parts, the content and the method of education; and it is particularly the method of education in which I am interested at the present time and which I have in mind to criticise in calling attention to this report. The last one is the product; and the product ought to be checked up against the aim to see if it approximates in any degree what we try to do when we set out.

There was one point in Dr. Edsall's paper at which he referred to the laboratory method. The laboratory method is now in the way to receive some criticism. I think in a few years this criticism will increase. The method is comparatively new. Approximately a hundred years ago it began to be widely introduced. As a result of this method there has been a tremendous growth in science which has transformed our modern world. Some people thought that if it was so useful in acquiring knowledge, it ought to be useful as an instructional method. Therefore, perhaps fifty years ago, it was introduced as an instructional method. Science was introduced into the schools as a part of the curriculum, and the laboratory method was introduced as a part of the science course. We have now many expensive laboratories. What is the result? Some of us think that the results at the present time have not justified the procedures. We pay a great deal for the laboratory method and what do we get? We ought to get many fine things—the things that Huxley said ought to be true. But the introduction of science into the curriculum has not produced the results that Huxley thought it was going to produce. We find much opinion favorable to the laboratory method and we find firm conviction favorable to the laboratory as an instructional method. We find, however, that the facts or data upon which we may base conclusions to be unsatisfactory or inadequate. Very few comparative studies have been made to see by which method the student will actually learn better and in such studies the conclusions have not been entirely favorable to the laboratory method. We have, I think, taken too much for granted. Recently, there has been published a brief study by Donald Laird in regard to the laboratory methods in a course in educational psychology. The students who came back the following year were asked about the course, and it was found that for one student who said that he or she had not faked the records, there were five who said that they had. This was a course in educational psychology. The experiments were performed outside of the class; and for one who said "no faking," five said that they had faked the records. Some said "Why not? It is just a waste of time, there was no point in carrying out the experiments when we know the results beforehand." These were students of collegiate grade.

The whole system of laboratory instruction is to be criticised, because it has not yet produced the results which it ought to produce, which we think it ought to produce. I have faith that the system will be changed in the next few years so that the laboratory methods will produce what we try to get into the students, or out of the students, by the laboratory method.

To go back to the remarks of President Butler:—he said that in the engineering school they had settled some of the problems with which medicine is now confronted. So I went to the men interested in engineering and found they were not quite so optimistic about their problems. But I found somebody among the engineers who knew just how medical instruction ought to be given. But he had not had much experience in medicine. But I did find an eminent physicist who made a remark worth considering. I said "How can we get these medical students to use the scientific method? That is the important thing. They must use it instinctively. How do you do that in engineering?" And he said that that was a matter which his department considered at least once a year and the only conclusion they were able to reach was that it was not possible to do it with the undergraduate student. In engineer-

ing it could not be done until the student was confronted with a problem which he had to solve. I think that is a leaf from the engineer's book which we might take and consider thoughtfully. It is not going to be the way we can overcome some of the difficulties in medical education, by confronting the students with problems? Unless the student has somehow got hold of the scientific method and knows how to observe carefully and then draw proper conclusions on the basis he had laid in his observations, unless he can do that, he is behind the times a week after he gets out of the medical school.

Now the title of the paper is "The Product of the Present Day Medical Education." I have not said anything about that but I have spoken about the process. I agree with Dr. Edsall on many of the points he has made. The product is not as bad as many people think it is. It is not what we want it to be; but I have been touched by the quick, eager response some of these young people make to something outside the more formal matters of the curriculum. By formality I think we have killed a good deal of the enthusiasm of the students. I think the first year is almost as deadly to enthusiasm as anything could be. If we can only do something to give them more enthusiasm, something to develop their enthusiasm, we shall have done a great deal.

If we can, in the first place, get a clear idea of what we are trying to do in medical education; if we can select better the material which we have coming into the medical school—and only at the present time are we beginning to realize that that process of selection is a problem involving more than mere semester hours and grades—if we can bring the processes of medical education up to date so that they are as good as the processes in other fields—as to the content, we can get along with great variations in content—then we shall have a product which will be far more competent to carry the responsibilities of the medical profession, to grow and to make progress in medicine, than what we have at the present time.

Dr. A. S. Begg, Boston: The title of Dr. Edsall's paper is "The Product of Present-Day Medical Education." I think one is inclined to believe, as a result of what one reads and hears on the subject, that the practitioner has come to be regarded as a by-product. As a medical educator I am greatly pleased to hear a paper like that of Dr. Edsall's presented before such a group as this. You are, after all, the men who are meeting the conditions of everyday practice, without the bias of a teaching contact. You see the "present-day product" in action, or what he interprets as action and you, better than any other group, can point out his shortcomings.

Recently a distinguished educator, not in medicine, has suggested that we make a survey to find out just what is needed in beginning the practice of medicine. It may be that this is a good thing, but perhaps we teachers would be unable to furnish it, if you suggested it, but I am inclined to the belief that it is not far away from what we in a feeble manner are striving to give. This means a general knowledge of fundamentals throughout and a mild spirit of curiosity and enthusiasm. We all know that Dr. Edsall has stated the case when he points out that a recent graduate has only been equipped for the beginning of his study.

The essayist has called attention to some of the criticisms of our training methods, which to some appear to be full of holes, but I am quite sure that, if you will make a comparison with conditions, say twenty years ago, you will find the system much improved. No one realizes any more than the medical educators what the gaps are, and when proper measures are at hand, they will be utilized.

It is a pleasure to hear such an emphasis placed upon the out-patient department, where the important work of the next educational period will be carried on. It is here that the teacher and the student have the widest contact with the public, and public opinion will be moulded largely as a result of the influence of this contact. We have for a long time asked how to reach the public effectively and have overlooked a method already at hand. Opportunities for personal instruction and guidance in principles of right living are offered in the out-patient department as nowhere else.

The fitting of students for entrance to the homes of their patients after graduation is indeed a difficult matter under our present method, but perhaps some improvement may be accomplished during his training as an interne by proper outside apprenticeship. In this connection one thinks of the possibilities of the social service department of the hospital, but whatever means is adopted, it is certain that something must be done to correct the impression of helplessness so frequently met in the young man who has suddenly been removed from the facilities of the hospital, upon which he has leaned perhaps too long.

We have discovered that one scheme of training cannot be fitted to all schools, nor even to all students in the same school, and with this discovery always in mind I believe that rigidity of curriculum will tend to disappear and that we can face the future with confidence.

(No further discussion of this paper.)

# ON THE TREATMENT OF EXPHOTHALMIC GOITER*

BY G. W. HOLMES, M. D., J. H. MEANS, M. D., C. A. PORTER, M. D., E. P. RICHARDSON, M. D., AND M. P. STARR, M. D., BOSTON

WHAT is the best way to treat exophthalmic goiter? This is a question which must frequently present itself to the mind of the practitioner. In spite of the fact that in recent years wide study has made for much progress, there still remains some difference of opinion among practitioners as to what constitutes the method of choice.

We have made certain studies along this line ourselves and shall now present to you an outline of them together with our conclusions, based both on our own work and on that of others, as they stand at the present time. We might add that the latter are different now from what they were a year ago, and very likely from what they will be a year hence. This is bound to be so until the ideal method of treatment is discovered, that is to say, the treatment which successfully removes the fundamental cause of the disease. In the case of exophthalmic goiter even the cause is still quite unknown.

Our method of attack has been the intensive study, by clinical and laboratory means, of groups of patients treated by various methods. We have attempted to get exact information on existing forms of treatment rather than to devise new forms. During the ten years that the work has been in progress, the basal metabolism has been constantly used as a quantitative index of the intensity of hyperthyroidism. As an adjunct to careful clinical observation, but never as a substitute, it has proved of distinct worth. It has rendered material aid in the accurate evaluation of the real efficacy of the several forms of treatment that have been under scrutiny, and has, we believe, in the case of certain of these, furnished a basis for correct prediction of therapeutic result[1].

In judging of the value of a form of treatment in exophthalmic goiter as in any other disease, the spontaneous course must be borne in mind which in the case of exophthalmic goiter is well known to be quite varied. It is easy to find cases in whom the invasion has been rapid, and also others in which it has been slow. Spontaneous recovery or intermissions undoubtedly occur.

The nearest approach to an accurate study of the course of the disease when untreated is that of Kessel and Hyman[2]. These investigators have carefully observed the clinical and metabolic phenomenon in 50 cases treated only by rest, or by rest and iodine. They have expressed the basal metabolic rate of this group in the form of a composite curve which is shown in Fig. 1. (Curve I.) This curve constitutes the best con-

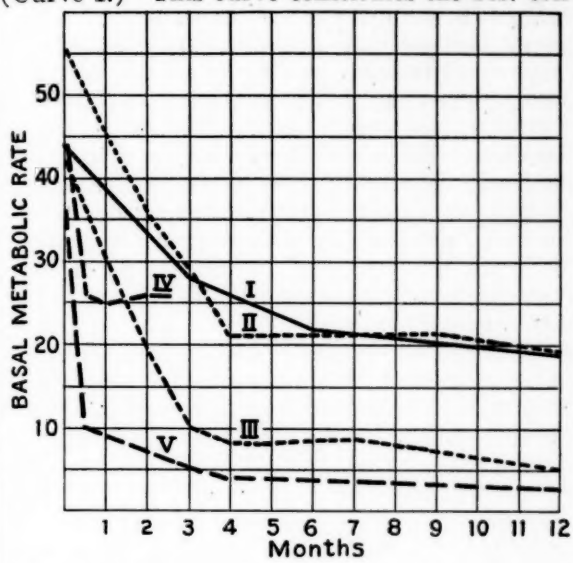


FIG. 1. Curves showing variations in the average basal metabolic rate in groups of patients under different forms of treatment.

Curve I (from Kessel, Lieb and Hyman). Composite curve of metabolic rates in patients untreated except by rest.

Curve II. Composite curve of all cases treated by X-ray at the Massachusetts General Hospital. These cases were followed one year.

Curve III. Composite curve of five cases showing striking improvement following X-ray treatment.

Curve IV. Curve showing effect of removing one half of the thyroid gland (hemithyroidectomy).

Curve V. Curve showing effect of subtotal thyroidectomy.

trol curve in existence with which to compare the curves of patients treated by other procedures. It is not strictly speaking of an absolutely untreated group, for the factor of rest comes into play to a certain degree, and it is a matter of common knowledge that rest alone will often, to a certain degree, ameliorate the symptoms of exophthalmic goiter. Furthermore, the course of their patients may have been favorably influenced by iodine. There probably is a rest factor of somewhere near the same magnitude in most of the other groups that are suitable for comparison.

At the time we began our investigation the operative mortality in exophthalmic goiter was higher than it is today, and the results less uniformly good. The X-ray had been recommended instead by some enthusiastically, so we undertook an extended study of its effect. Reports on the work have appeared from time to time and at present we feel that we know fairly exactly what may or may not be accomplished by this agent[3]. The composite curves of the basal metabolic rates of two groups of patients so treated will illustrate our views. (Fig. 1 Curves II and III.) First of all it should be pointed out that in about a third of the cases there was no evidence of improvement during irradiation. In the other two thirds, there was evidence of improvement and Curve II shows the average

*From the Thyroid Clinic of the Massachusetts General Hospital. This paper is No. 31 of a series of studies in metabolism from the Harvard Medical School and allied hospitals. The expenses of this investigation have been defrayed in part by a grant from the Proctor Fund of the Harvard Medical School for the Study of Chronic Diseases.

for the entire group. It is somewhat better than the Kessel and Hyman curve, but perhaps hardly enough so to be more than chance as has been urged by some writers. Curve III shows the composite for five patients in whom there was a rapid and striking improvement coinciding exactly with irradiation. It is this last curve, although granting that it is of the minority of the patients, that makes us believe that sometimes the X-ray has a rapid and striking effect. Particularly as in both groups the rest factor was slight, and in many of the cases absent, the improvement occurring while the patient remained at work. Spontaneous recoveries as rapid as this may occur, but they have not done so in our experience.

The effects of the operative procedure are more constant[4]. Ligation of the arteries, we may say, is rather constantly productive of but little tangible evidence of improvement other than perhaps a slight gain in weight. Removal of thyroid tissue, i. e. partial thyroidectomy, is productive of a great deal of improvement. The degree of improvement in the main seems to be proportional to the relative amount of thyroid tissue removed. This is well shown by Curves IV and V which represent the results obtained in a group in which the operation of so called hemithyroidectomy, and another in which that of subtotal thyroidectomy was done. There is a prompter and more striking drop in the basal metabolic rate following operation than in either the control of X-ray groups. In the case of the hemithyroidectomy group, however, the drop stops in the neighborhood of plus 25 per cent. This curve cannot be continued in the figure beyond two months and a half, because many of the constituent patients underwent further surgery. We can say, however, from certain that did not, that it is not uncommon to see basal metabolic rates of plus 20 per cent. a year after hemithyroidectomy. In other words, this procedure brings about a definite and rapid improvement, but often not a complete cure in the sense of restitution to a normal level of metabolism. The results at the end of a year are little, if any better, than in the X-ray groups shown by Curve II. It was these facts that led Means and Aub to conclude in 1919 that the results with Roentgen therapy were equally good to those with surgery. The surgical data available at that time were for the most part in patients who had had hemithyroidectomies prior to the War.

The effect of subtotal thyroidectomy is very striking and far more constant than that of any other procedure. It is shown by Curve V in Fig. 1 and also in Fig. 2. Curve V, Fig. 1, shows that following the operation there is a drop to a normal metabolic level within two weeks and no subsequent rise. At the end of a year the basal metabolic rate of plus 3 per cent. shows that the procedure employed has accomplished all that could be expected. It has brought about, with rare exceptions, a cure which is as complete as the organic damage previously done to the patient by the disease will permit.

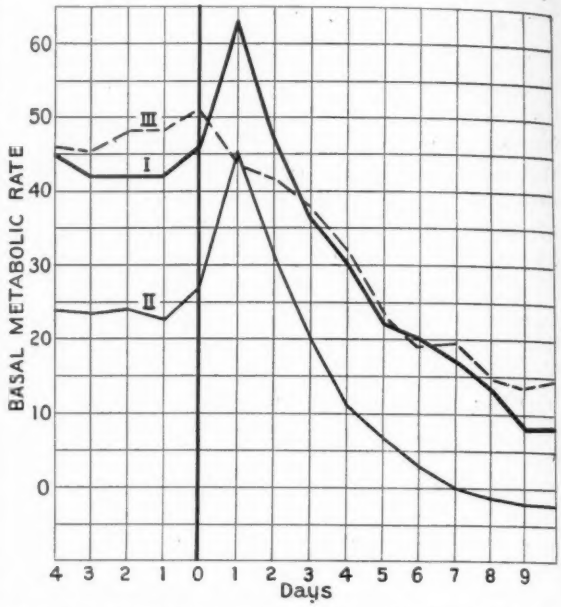


FIG. 2. Composite curves of basal metabolic rate showing fall following subtotal thyroidectomy and use of iodine. Note that in this figure the time is expressed in days instead of months as in the previous figure.

Curve I. Rate of fall following subtotal thyroidectomy in a group of cases having an average preoperative basal metabolic rate of plus 42 per cent.

Curve II. Rate of fall following subtotal thyroidectomy on a group of cases having an average preoperative basal metabolic rate of plus 24 per cent.

Curve III. Rate of fall in eight cases showing a marked effect from the administration of iodine (Lugol's solution).

So rapid was the drop with subtotal thyroidectomy that last year Dr. Segall[5] undertook a series of daily observations on patients who had had this operation, or a final operation giving a total removal of at least four-fifths of the gland. The curves of the individual patients studied were all strikingly alike and their composites are shown in Fig. 2. Curve I is that of a group of patients whose preoperative basal metabolic rate was the neighborhood of plus 42 per cent., and Curve II of plus 24 per cent. Aside from the preoperative and postoperative rise, which occurs in both groups, the rate of detoxication from the preoperative level is equivalent to 3.7 points drop per day in the basal metabolic rate for each group. In other words, detoxication following this operation proceeds at even rates until a normal level of metabolism is reached. The length of time therefore necessary for recovery, since the curve slopes are similar, depends on the height of the curve at the start, that is to say, on the preoperative intensity of hyperthyroidism. Following subtotal thyroidectomy, after the metabolism has returned to normal limits, it remains there apparently permanently.

We have no series of comparable data on the immediate effect of hemithyroidectomy, but judging by the results obtained in certain indi-

vidual cases, it seems probable that the drop following hemithyroidectomy is similar except that it either ceases before a normal level is reached, or else a secondary rise occurs with a return of a thyrotoxic state of somewhat less intensity than the preoperative.

It may be well to summarize the conclusions up to this point, because during the last year the introduction of a new therapeutic agent (or more exactly, the re-introduction of an old one) by Plummer[7] has thrown an entirely new light on the whole problem.

First of all it may be reasonably concluded from the data presented in outline above:

1. That hemithyroidectomy is an incomplete operation. It partially, but not wholly, relieves the disease. In patients seen 3-4 years following this operation and apparently well, it is to be inferred that the element of time and spontaneous recovery has contributed a portion of the total result[8].

2. That subtotal thyroidectomy brings about a rapid restoration to an essentially normal state.

3. That the benefit of X-ray is less certain. That is, if it is to occur at all, it should be apparent within four months.

As they stand, other things being equal, these conclusions would seem to leave no case for any treatment except subtotal thyroidectomy. The certainty of this procedure was in marked contrast to the uncertainty of irradiation. Other things, however, were by no means equal; in the first place, there was a risk of death from operation distinctly greater than the risk of death from the disease in patients treated by X-ray alone. Secondly, operations were often done in several stages thereby occupying three or four months time. Since there was a chance that X-ray might effect a cure, it was believed conservative in the majority of cases to start that first and if restoration to normal had not occurred in four months to advise operation. In such cases as seemed to require a series of operation, X-ray was sometimes started along with the surgical program with the idea that the total surgery necessary would either be less or safer to the patient, in other words, to use X-ray when it did not effect a cure as an adjuvant to surgery or as a preparation for operation.

A year ago Plummer[7] re-introduced the use of iodine, which had fallen into disrepute, in the treatment of exophthalmic goiter. His theoretical reasons for using it are not entirely convincing, but his claims as to its effect have been readily confirmed[9]. Iodine given in the form of Lugol's solution (Liq. Iod. Comp. U. S. P.) fifteen drops per day has produced rapid fall in metabolic rate and toxic symptoms in more than eighty per cent. of our series treated with iodine this year; in fifty per cent. this remission has reached a normal basal metabolic rate in eleven days; in from ten to twenty per cent., perhaps because of complications such as pregnancy and cardiac failure, the iodine has not decreased the effects of the disease but it has not made them worse. When most successful as in fifty per cent. of our series the Lugol's solution will cause a drop in basal metabolism and pulse and improvement in symptoms which is as rapid and as great as that following subtotal thyroidectomy. This is very astounding, but nevertheless true. In Fig. 2 Curve III is the composite of eight patients receiving Lugol's solution; the line 0 denoting the time the drug was started. Save that it lacks the one day peak, it is nearly superimposable on the Curve I of subtotal thyroidectomy. It is interesting to note that in normal persons made thyrotoxic by feeding thyroid, the rate of detoxication on cessation of taking the drug has essentially the same slope as these three curves shown in Fig. 2. This we have noted in several normal subjects.

Further studies with Lugol's solution have shown that omission of the drug is followed by a rapid return to the previous toxic level, and that indefinite continuation of it is often followed by a slow return of hyperthyroidism. It is therefore a palliative not a curative agent. The introduction of iodine however has brought about two important changes in our general program of management of exophthalmic goiter. In the first place, as a preparation for operation it accomplishes what we formerly sought to accomplish with X-ray, that is, reduction in intoxication before surgery is begun, only it does it more certainly and more quickly. Secondly, it reduces the toxic reaction which follows operations in patients with exophthalmic goiter. The lessening of this reaction and the absence of nervous tension is striking in the patients who have taken Lugol's solution. Operation is safer, and the operative program can be carried out in one stage more frequently than before. However, the principles of preliminary graded operation should be abandoned with care.

If operation can be reduced in most instances to one stage, and if the operative risk is greatly lessened, the chief arguments against surgical treatment are removed. Our conclusion at present therefore is that iodinization followed by subtotal thyroidectomy while the metabolism is normal, is the best program for the treatment of exophthalmic goiter that has yet been advanced. X-ray will still have its place in patients in whom, for any reason, operation is undesirable, or who refuse operation. When employed it should be as in the past. We have not found that iodine contributes anything to the success of irradiation. With regard to irradiation, it should be noted that the methods of application are still in somewhat experimental stages. Some of the failures in the past may well be due to insufficient dosage; this fact should be kept in mind when comparing end results. It is likely that

with improved technique the results by irradiation will become less uncertain.

In closing it may be well to repeat that iodine is essentially a preparation for operation, not a curative agent. It should only be given when surgery is to be performed immediately after. The time of operation should be selected with care. If advantage is not taken of the iodine remission, a golden moment may be lost. It may not be possible to get such a remission a second time, or at least not until after a long period without iodine.

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DISCUSSION: Dr. F. H. Lahey, Boston: I am very much interested in this excellent review of the thyroid subject and I think we owe the Massachusetts General Hospital a great deal for having gone over the various methods of treating exophthalmic goiter.

I have been opposed to X-Ray from the outset perhaps based somewhat on the fact that I have naturally seen the end results of X-Ray treatment—there has been a high percentage of failures from X-Ray treatment—and furthermore from the fact that we have been unable to obtain at the City Hospital a satisfactory percentage of cases treated with X-Ray from the point of view of complete cure. One must admit that X-Ray has certain values, but it must be realized that when a patient can be gotten well surgically with a mortality lower than the type treated otherwise, that is medically including X-Ray, then I think one must group the cases in the two ways. Now there has never been a year in our Clinic in which those patients who have been treated medically did not have a higher mortality than those patients who were treated surgically.

The question of mortality in surgery, I think, is settled. There are few well organized thyroid clinics where the mortality is over one percent. Our own mortality has been estimated for me. In the past four and a half years we have had a total of 1864 thyroid operations with an operative mortality of .9 percent (nine tenths of one percent). This has been on 1248 cases, which is a patient mortality of 1.3 percent. These have been unselected cases. Operation has not been refused to any patient who could get to the hospital. They have included the group of cardiac decompensation cases up to the point where at times venous section was immediately necessary to save their lives. They have included the diabetic cases which have come in under Dr. Joslin's care and treated for diabetes; in fact every possible case. Therefore I think the mortality from the surgical operation must be considered as very low.

It is interesting from the point of view of statistics that living in a non-goiter district our problem is different from that of the Great Lakes region. For instance, our cases have shown 31 percent of non-toxic goiter and we have had a remainder of toxic goiter of which 43 percent is primary hyperthyroidism or exophthalmic goiter and 26 percent toxic adenoma. That is just the reverse of what occurs in the goiterous regions. Exophthalmic goiter there is said to be 25 percent while secondary hyperthyroidism or toxic adenoma is about 50%.

In reviewing DeQuervain's recent book on goiter I observed that he states that exophthalmic goiter in Switzerland is from four to five percent. So that in this region we deal with a more toxic group as primary exophthalmic goiter is more dangerous than the secondary hyperthyroidism. So much for the mortality and the group.

Now I would like to say a word about Lugol's solution because I think a great deal of harm will be done by this Lugol's solution. My original criticism of the X-Ray for goiter doesn't apply to the Massachusetts General Hospital because there the patients came before a group of men qualified to say whether they had goiter and of what type and qualified to submit them to the proper treatment, but when the problem is settled by a group of men unqualified it may bring up a situation which is bad for the patient and this is likewise true of Lugol's solution. Now to throw this Lugol's solution into the hands of everyone at the present time is bad business. To begin with, we have repeatedly seen benign adenoma of the thyroid converted from a simple, non-toxic goiter into the disastrously toxic one by the prolonged administration of iodine. And it is not easy for us dealing with thyroid daily to decide which is adenoma and which isn't an adenoma. Certainly the administration of Lugol's should be put only in the hands of men who are competent to say which is the type which can be benefited by it. We have made mistakes with Lugol's, and you should have the benefit of them. It will drop the metabolism in a number of cases. We are treating every fifth case with Lugol's solution. It will drop the metabolism, but the difficulty with this metabolism rate is that it is graphic, and you should not depend on the metabolism uncorrelated with clinical findings. It is like a temperature chart. It is easy to say when you see a

metabolism drop "this is a good risk." We have just had a patient of Dr. Joslin's whose metabolism dropped from 65 plus to 18 plus. There was an improvement in his condition, and we went ahead under local anesthesia because he also had fibroid tuberculosis, and we took out one lobe. He stood it well, and because he had a low metabolism and did well from one hemi-thyroidectomy, we took out the other lobe, and he died from thyrotoxicosis. In this case we were mislead by the apparent improvement with Lugol's solution and did too much.

Any group that gets a low mortality gets is from its experience with the cases—how much to do to them, what to do with them, and when to do it.

I think the value of the multiple stage operation can never be overestimated. It is their trial value which is so valuable. What is the value of ligation? As the reader said, the *Metabolism* doesn't drop with ligation. The advantage is this; in a well organized thyroid clinic the patient will not die on the table. But the one thing you cannot prophesy is the untoward reaction, and all of our deaths have been of that type. If you trust to Lugol's solution, you have no trial. You can get them off the table, but you have this danger of untoward reaction which always faces you. If you do ligation there is something valuable about it, whether it is due to the fact that the patient is psychically adjusted or whether it is due to less thyroid activity due to lessening of the vascularity, I do not know. I do know, however, that if a patient stands one ligation, he will stand another, and if he stands two ligations he will stand having his skin flap raised, and if he stands that, he will stand a hemi-thyroidectomy, and if he will stand a hemi-thyroidectomy, he will stand a second one. And it isn't so much the number of operations, it is whether or not the patients get through safely. Lugol's solution may raise the mortality if we permit it to eliminate trial procedures. We must not drop a method based on sound principles which has given excellent results and that is the multiple stage operation.

Dr. Jordan of our Clinic is publishing the result of her work, 5,223 metabolism tests on 1,248 operated cases, metabolisms being done pre and post-operatively. From these results we have come to some very definite convictions. One is that patients who do not have an elevated basil metabolism do not have hyperthyroidism, and patients who had pre-operatively an elevated basal metabolic rate are not cured unless their metabolism comes to normal post-operatively. We have insisted that patients be metabolized every two months for 6 months and at the end of a year. If their rate doesn't come to normal at the end of a year, then one must re-operate on them and take out some more thyroid to cure them. You cannot depend on basal metabolism to tell how much operating patients will stand, but you cannot diagnose many borderline cases without it.

I have often said "Lord help the patient with a non-toxic goiter and a tachycardia of non-thyroid origin." Unless she gets into the hands of someone particularly interested in borderline cases she will be very likely to lose her goiter with no benefit to her tachycardia.

What are the causes of failure to cure in toxic thyroid surgery? One is insufficient removal of thyroid; and the other is operating on patients who do not have thyroid disease. There is a group of patients called N. C. A. cases—neuro-circulatory-asthenia cases,—for want of a better term. In the army they were called soldier's heart, effort syndrome and disordered action of the heart. These cases very closely simulate some of the cases of primary hyperthyroidism. They have tremor, tachycardia and complain of loss of strength. They closely simulate hyperthyroidism and can be differentiated only by the most critical study. These are the patients most often wrongly operated under the mistaken diagnosis of hyperthyroidism.

The mortality of thyroid operations done casually will be high always, and the percentage of cases uncured will be high because of an uncritical study. The important thing in connection with thyroid cases is that they be centralized and that they be individualized, and if that is done and if they are operated upon early, before they get permanent cardiac damage, then excellent outcomes will be obtained and a low mortality will result.

Discussion: Dr. C. C. Sturgis, Boston: We have had some experience with all forms of thyroid therapy at the Brigham Hospital in the last eleven years. Our conclusions agree substantially with Dr. Means at the Massachusetts General Hospital. At present we think the most efficient treatment is surgery in combination with Lugol's solution as a pre-operative measure. When I say "surgery" I mean surgery done by one who is interested and experienced in this special field and combined with careful pre- and post-operative treatment. In the pre-operative treatment there are at least two aspects of the disease which I believe should be considered. In the first place, there is a certain percentage of these patients who have serious cardiac damage. Those patients should be treated with rest and digitalis like any patient with a failing heart. We do not think it is advisable to routinely digitalize all patients unless there is some indication of heart failure such as an enlarged heart, edema, auricular fibrillation with a pulse deficit or other similar evidence. After the maximum improvement has been attained in the heart condition, we believe at present that Lugol's solution is a very efficient pre-operative drug as it produces a lowering of the basal metabolism in a large percentage of patients. Our custom has

been recently to use Lugol's solution in small doses, five drops three times a day for a period of a week or ten days. It has been our experience, as at the Massachusetts General Hospital, that at this time the metabolism will fall to within normal limits or to only slightly above normal in most instances. It renders the patient not only a better operative risk but the post-operative course is much shorter.

I would like to emphasize that Lugol's solution has some real dangers, and one which we observed early and are careful to avoid is the sudden increase in metabolism which may occur when the drug is discontinued. We learned that you should operate upon the patient when the maximum effect from Lugol's solution has been obtained. If a satisfactory reduction in the metabolism has been obtained, but the iodin therapy is not continued on the day of the operation or during the post-operative period, there may be a sudden increase in the metabolism, to a level higher than before, and this may produce serious results. The Lugol's solution, therefore, should be continued up to the day of operation and after the operation, by mouth if possible or by rectum if necessary.

As far as our experience with X-ray is concerned, we have treated a limited number of patients. There is no question in my mind but that in certain instances the X-ray produces a very beneficial effect on some patients, but it is only in a small percentage of instances in which you see this improvement. In a large number we have observed no effect at all. We rarely use it now unless the patient insists, or decides against an operation. We will use it if it is understood that the chance of cure is not great and provided the patient is in good condition and can remain under observation.

There is one other point I would like to emphasize. Dr. Lahey mentioned that the metabolism indicated the diagnosis in these patients and also the fact that if the metabolism did not come down to normal, the patient was not cured. That has been our experience. There is no compromise in this disease. The patient is either well or not well. If the metabolism falls somewhat but does not reach normal, the patient is not cured and you have not solved the problem. That is what has happened with X-ray many times in our experience. The metabolism may fall a total of 15 to 20 per cent, but I do not feel that this indicates that much had been accomplished. The patient must be completely cured or further therapy is indicated.

Discussion: Dr. M. P. Starr, Boston. I would simply say that the use of Lugol's solution is in its infancy. I might take the liberty of quoting a statement made by Dr. Boothby at the Atlantic City meeting a month ago of the American Society for Clinical Investigation. He said that since Lugol's solution had been introduced at the Mayo Clinic there hadn't been a single death in seven months of the cases of exophthalmic goiter receiving it which had been operated upon. The dangerous thing about Lugol's solution is that the iodine remission is a short one. We cannot tell when it will come. It may come in two weeks or two days. If that moment isn't taken, the metabolism returns to its previous level, and no amount of iodine will decrease it unless the patient is kept in bed for two months without iodine and then a second iodine remission can be obtained. Even when iodine isn't successful, there will be an iodine reaction, if the iodine is stopped. That is, the metabolism will increase up to its previous level whether the metabolism is falling or rising. If on the fifth or sixth day of such a curve (Curve III) the iodine is omitted, the metabolism will rise to a level above what it was before, and the patient will be in a more serious condition than before.

Dr. Charles A. Porter, Boston (closing).

The Thyroid Clinic at the Massachusetts General Hospital attempted to approach the problem quite impersonally. In the beginning, with two surgeons and two physicians in the group we deliberately planned to give to Dr. Holmes, for X-Ray treatment, doubtful cases, and those who refused operation. We concluded that the X-Ray would cure a certain percentage, and would render some safer for operation. There were cases, however, that in spite of long treatment, due possibly to inadequate dosage, did not respond, so that we limited the X-Ray period to four months, after which surgery was indicated. Until the past year we performed the graded operations, as just recommended by Dr. Lahey, but recently our experience with the administration of Lugol's solution has been so satisfactory, that we have been able, instead of doing a primary subtotal thyroidectomy in about twenty-five percent of the cases, to perform a primary thyroidectomy in one stage in about seventy-five percent of toxic goiters. It will take a very much larger series of cases than we have had to prove whether the ultimate mortality of these cases will equal the very low mortality of the grade operation, for it is obvious that several operations are not desirable if equally good results can be accomplished by one or at most two. Lugol's solution in extremely toxic cases has been proved to approach in value the use of insulin in diabetic coma. In these very severe cases operation is contraindicated, and the results of this drug have been almost miraculous. In regard to the objection which Dr. Lahey raises against Lugol's solution, that if advocated widely it will tend to be used as a treatment for Graves' disease, I think we must bear clearly in mind that Lugol's solution should only be used as a preparation for operation, not as a substitute for surgery.

# PERSONAL OBSERVATIONS IN HYPERTENSION

BY FREDERICK R. BARNES, M. D., FALL RIVER

In reviewing our cases of hypertension which have appeared during a period of four years we have included all cases having a systolic blood pressure of 160 mm. of mercury or more. We have included all cases whether they appeared because of a previous knowledge of high blood pressure or for some other complaint or for no complaint whatever. The last statement is gradually including an ever increasing number of people, for those who come in to have a routine physical examination is constantly getting greater. It is also true that the number of people who come in and know that they have a high blood pressure is ever increasing and most of them desire to know its significance. To determine its significance per se seems to us a difficult problem. Many of the patients themselves feel certain that it portends "a shock" and this question we do not feel capable of deciding for them or for ourselves. As a matter of fact it is surprising in those who have died how few have gone due to this cause. On the other hand we had one case, a man of 44, who had what seemed to be a vascular hypertension who died of cerebral hemorrhage. This man had been examined by many men in many cities and aside from his hypertension no one was ever able to find anything. It is interesting in passing to state that for a period of about three months his pressure was controlled by the use of 1/2 gr. thyroid gland three times a day.

We have been impressed as time has elapsed by the large number of cases that originally seemed to be patients with vascular hypertension who have developed a nephritic element. So frequent has this been that we have wondered if there might not be some renal fault which we are at present unable to determine or that we attribute to some unknown endocrine disturbance. We have frequently tried the endocrines in these cases of vascular hypertension but only in three instances have we seen any beneficial results, the first the one I mentioned above. The second was an eleven year old child, mentally backward (in the second grade in school), had menstruated from the age of nine and was markedly obese (weight 142 lbs.) but not edematous. Her blood pressure was 228/180. At the time we saw her we were not equipped to do basal metabolism but thyroid therapy had no effect, 5 grs. of corpus luteum for a period of two months made the most astounding difference in not only the child's blood pressure but in her personal appearance, mentality and general health. The third case was visibly an endocrine individual of most unusual appearance. All the endocrines did her no good and as a last resort testicular substance was used with a diminuition of her pressure from 238 to 140 where it has now remained for more than a year.

We have been surprised to see with what comfort and with what little danger patients who have high blood pressure withstand major surgical procedures. I have had three cases of acute suppurative cholecystitis due to gall stones with pressure of 186 or more operated without untoward effects; a number has had supravaginal hysterectomy for myoma uteri; two for carcinoma of the cervix and one for carcinoma of the fundus of the uterus, and a number for other causes. In passing I would like to note that we have never seen the removal of a fibroid have any effect toward lowering the blood pressure.

There have been a number of distressing symptoms for which these people with hypertension have presented themselves, the most distressing of which have been:—praecordial pain, vertigo and tinnitus aurium. Praecordial pain and upper abdominal distress I feel that I personally have more frequently seen as a symptom of hypotension than of hypertension. This may, I of course realize, be due to the time at which it has been my lot to see the patient, the patient previously having had a hypertension and I seeing them at the time of commencing heart failure with the anginoid pains. However, the cases of praecordial pain that are associated with hypertension nearly always have had an associated dyspnea and I have been unable to find any treatment other than rest in bed that has had the slightest effect toward relief. We have been unable to note any relation between the degree of distress complained of and the height of the pressure. This may be due to the fact that some persons complain more readily than others with the same symptoms and symptoms of the same degree.

It has also been true in the cases who have vertigo that we have found nothing that has the slightest effect in relieving this distressing symptom. We have noted that these cases have been likely to have very tortuous retinal vessels but when the eye specialist and the ear specialist have been unable to help we have felt entirely at sea to give them relief.

Tinnitus too has caused untold distress and it would seem that these patients as time progresses gradually get used to the symptom but that treatment does little toward relief. We have noted that there seems to be a definite relation in the cases with tinnitus and praecordial distress to the pulse pressure. In those whose pulse pressure is eighty or more these symptoms seem to be more marked and more likely to occur.

We have had five cases of what one might coin the term of hyper-hypertension and these cases have each had a systolic pressure of 290 or more, they also have each had a definite nephritis and all have died in uremia. They each had a retinitis for a varying period before death with retinal detachment.

We have had two cases of blood pressure paradox or what really amounted to freaks in our own experience. The first was a Hebrew man of 67 who had had cerebral hemorrhage of only about half an hour's duration when we saw him. He had a systolic pressure of 180 and a dyastolic of zero. We have seen two cases of hyperthyroidism with normal systolic pressure and very low or even zero dyastolic pressure but never one before with so high a systolic pressure. It naturally makes a difference whether one reads the dyastolic pressure at the fourth or the commencement of the fifth phase but usually the difference is so slight as to be negligible. These cases with extremely low dyastolic pressures seem to suffer no inconvenience and if it be true that the pulse pressure measures the driving force of the heart they should be at least as well off as those of us who have a normal dyastolic pressure.

The other case of freak was in a man with apparently a partial endarteritis obliterans. The pressure in his arms was 170 systolic and the same in his left leg but in the right leg the systolic pressure was 208. This man subsequently died following an operation for hypertrophied prostate. This inequality in pressures in this type of case I believe we would find more frequently if we more frequently looked for it as we have learned to do in the arms in cases of aneurism.

We have also been impressed by the rather unusually high pressures we have found in women between the ages of 38 and 48 and with how little evident pathology the condition is associated. We have had the opportunity of seeing a number of these cases pass through the menopause with a gradual diminution of their pressures. Just what part the menopause plays is a thing to be considered. We have not however noticed any relations between the degree of hypertension and the severity of the nervous symptoms complained of at this time.

We have also observed that the blood pressure in women when increased was less frequently associated with demonstrable cause than in men and as a side note in our experience we have observed that the normal blood pressure in women seems to average from 6 to 10 mm. of mercury higher than in men.

Our conclusions from the study of these cases would be:—

(1) That hypertension frequently exists without any knowledge of its existence on the part of the patient and that when it does exist per se it is apparently of no great moment.

(2) The many cases which appear at first to be simple vascular hypertension subsequently develop a demonstrable renal element.

(3) That in a few cases the endocrines play a part.

(4) That hypertension in itself is not a contra-indication to a surgical procedure with a general anesthetic but is a finding that leads the examiner to make further determinations with considerable care.

(5) That there seems to be a definite relation in many cases between the symptoms tinnitus and praecordial distress and the pulse pressure.

(6) That cases with unusually high pressures usually have a severe nephritis.

(7) That in certain conditions a blood pressure parodox exists but apparently is of little significance.

(8) That women in our own series have averaged higher pressures than men and that many women at the time of the menopause have exceedingly high pressures with little discomfort and in certain cases this rectifies itself after the menopause is passed.

Discussion: Dr. Thomas J. O'Brien, Boston: The clinician regards the condition termed "hypertension" with dismay and confusion. The term itself is indefinite, in that all kinds of abnormally high blood-pressures come under this heading, whether the systolic and diastolic are both high or only one of these phases.

Among the causes given, for hypertension, may be enumerated, chronic infections, intestinal toxemias, obesity, old age, faulty diet, endocrine disturbances and heredity. When no known cause can be assigned, it is termed essential hypertension.

*Bell,* a pathologist, in some 4000 post mortems, reported 216 cases of essential hypertension.

*Walker & O'Hare* have recently reported their investigations on chronic infections as a cause of hypertension, and they find that infections do not play a very important part in its causation.

*Evans* says that old age is a factor, only, in that it permits time for chronic infections and intoxications to produce effects, which gradually overcome the vital resistance of the arterial wall.

*Alvarez*—after studying 15,000 cases of blood-pressure, reports that heredity is the cause of hypertension.

*Barker* feels that this condition is the result of what he terms "constitutional inferiorities."

*Newburgh,* also *Strous and Kelman,* were able to damage the kidneys, and produce nephritis, with a high protein diet, but did not alter the blood-pressure.

*Moschcowitz,* by clinical and experimental evidence, proved that persistent hypertension was a common cause of nephritis.

With all these facts, figures and fancies before us, we are impressed that persistent hypertension, whatever the cause, produces chronic nephritis.

We may have profound hypertension without arteriosclerosis, and marked arteriosclerosis without hypertension.

Students are taught that the vascular system,

heart and kidney are the three weak links, in the chain of a case of hypertension. A fourth weak link, and an important one, is the retinae, as we often find the first demonstrable evidence of arteriosclerosis or renal disease there. Mott's Rule offers something of a helpful nature and Coburn recommends its use, in surgery and obstetrics.

Divide pulse pressure by diastolic pressure and if the result is 40 to 60%, it places the patient in the class of "good surgical risks." If 25 or 75% the patient is listed "probably operable": while below 25 or over 75% the patient is "probably inoperable."

There are no short-cuts in making a diagnosis, and we must not be influenced too much by a blood-pressure apparatus. It is advisable to follow the old rule, which is repeated so often at the Boston City Hospital. Consider every clinical case to be comparable to a sum in arithmetic. A well taken history; plus a thorough physical examination; added to the laboratory findings; and to the results of the instruments of precision, and we get a correct diagnosis. Hypertension is a condition, not a diagnosis.

Discussion: Dr. Everett A. Bates, Springfield: Dr. Barnes very kindly sent me a copy of his paper beforehand, and so I have been able to make a few notes and comments upon paper on what he has to say about the subject and upon the subject itself. Hypertension, as Dr. Barnes has said, presents itself in the majority of cases seen as a difficult etiological problem. Hypertension is so common, of such obscure origin, and has such a known relationship and association with arterial, cardiac and renal disease, that the significance of abnormally high blood pressure as a symptom, either of early establishing or terminally established disease, must constantly present the practical problem of how to arrest or how to relieve.

Certain more or less empirical and oft-times experimental therapeutic measures at present hold sway, because there is as yet no complete understanding of the real nature of essential hypertension.

Dr. Barnes has presented for our consideration an interesting series of cases with hypertension as one of the symptoms. It seems to me possible to differentiate these cases into those associated with arteriosclerosis and those of true primary hypertension. Those that seemed at first to be simple vascular hypertensions and later became definitely renal were probably cases of nephritis from the beginning. His "hyperhypertension" group were all that; superhypertensions always are; in which renal arteriosclerosis is the slowly increasing localized lesion. His cases of vertigo and tinnitus aurium may also be put in the cerebral arteriosclerotic class with the arterial process, and not the attendant hypertension, the cause of the symptoms.

As regards precordial pain—while most cases of angina are hypertensive, atheroma of the aorta can give a special quality of hypertension; namely, a disproportionate increase of the maximum over the minimum,—or in other words, a marked increase of the pulse pressure. So that some of the reader's cases of pain in the cardiac region with associated hypotension may have had aortitis, and thus, low, but disproportionate blood pressure readings, rather than cardiac failure as the cause.

It has been my thought that low diastolic pressures were of as great, oft-times of greater significance, than high systolic pressures. For, if we accept the assumption that the diastolic pressure represents the tonicity of the peripheral arteries and arterioles, and maybe, the tonicity of the aorta itself, rather than the driving force of the heart—a "blood pressure paradox,"—in the absence of aortic insufficiency with attendant aortic dilatation,—would suggest an aortic hypoplasia, natural in the individual case, or acquired through aortic disease.

In our study of a given hypertensive problem, hypertension and arteriosclerosis must by no means be considered parallel. For observations on hundreds of old people show normal tensions, though with pronounced arteriosclerosis; and long continued high tensions exist without resulting arteriosclerosis. They are two distinct processes, although they may co-exist. Hypertension, without renal involvement, is a disease of the critical age,—say, fifty years. Arteriosclerosis is a disease of old age; and there is no evidence that one is an evolutive stage of the other, although it has been commonly said that one follows the other. It is true that there have been some observations of arterial fibrosis due to mechanical causes, and theoretically "systolic traumatism" may have some influence; but it can only be a possible predisposing one.

The contention that all arteriosclerotic old people were once cases of hypertension which merged into arteriosclerosis is faulty, and gives hypertension an unimportance and mildness which cannot be supported clinically. Hypertension must stand by itself as a primary process, not as a compensatory and circulatory reaction due to pathology of the vascular bed.

Dr. Barnes has said that the large number of hypertensive cases that have developed a nephritic element has led to the suspicion of some renal fault at present undeterminable, or, to some unknown endocrine disturbance. In a discussion of the thought there may be truth in both of these opposing theories. Widal (he of the reaction) has stated that in hypertension there is always some, however minimum, renal lesion,—although admitting that renal lesion is only an intermediate step acting on the suprarenals. It is interesting to note in this connection that Ghoreyeb has found, in his work of injection of the arteries of the kidneys in those dying from various causes and with normal vas-

cular tensions, that some degree of renal arterial change was constantly present at 20 or 25 years of age; in fact that the only perfect renal arterial tree was found in a boy of ten years who died from accident. In other words, kidney disease as such may not cause hypertension, and by inference only a certain type may produce it.

The theory that excessive adrenalin secretion may lead to renal sclerosis, or its converse, that renal disease may cause hyperadrenalism, is most reasonable,—the attendant condition in either case being vascular hypertension. This thought couples the renals and the adrenals in a sort of partnership, as it were, wherein one is perturbed by pathology or defective physiology in the other. And inasmuch as the adrenals are found often enlarged as much as three times the average normal in hypertension subjects, the analogy of chronic suprarenal hyperplasia—producing an excessive or a specially toxic output of adrenin, and causing a definite symtomatology—and that of the thyroid in Graves disease, becomes, to say the least, striking. The theory appeals more strongly too when we consider the antithesis of increased adrenal output, as evidenced in Addison's disease with its astonishing hypotensions and low pulse pressures.

That the adrenals play a role in hypertensions is a conclusion difficult to escape. The struggle for existence calls for frequently recurring emotional stimuli to which the organism may respond through increased circulatory adrenin. It is rationally conceivable therefore that hypertension is due to a sympathetic endocrine disturbance, which may be the result of nephritis, or may be caused by toxic conditions without nephritis, or to simple nervous disturbance when too great strain has broken down the barriers of resistance and a faulty metabolism has resulted.

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## THE CLINICAL ASPECTS OF ERYTHREMIA

BY T. B. FUTCHER, M. B., BALTIMORE, MD.

It seems peculiarly appropriate that erythremia should be presented for discussion before this Society. In Osler's[1] original communication in 1903, in which he described the disease as a new clinical entity, he reported four cases of his own and five collected from the literature. Of these five, three were published by two of your members, two by Cabot[2] [3] in 1899 and 1900 respectively, and one by McKeen[4] in 1901. Subsequently the condition has been the subject of investigation by Reginald Fitz[5] and quite recently by Minot and Buckman[6] who in 1923 published a most important contribution dealing with the morphology and physical characteristics of the blood, which has thrown much light on the etiology of the disease. Bock and Means have published studies on the blood gases. Christian has laid emphasis on the nervous manifestations. It should be mentioned here that of the two remaining cases reported by Osler in his original communication, one was published in 1892 by Vaquez[7] of Paris, whose name has also been given to the disease, the other by Saundby and Russell[8] in England in 1902. Ever ready to give due credit to investigators, Osler in his original paper quotes the latter authors as saying that their case probably represented "a definite clinical entity and one which is new to medical science."

In the literature the affection has been variously termed Vaquez's disease, Osler's disease, polycythemia vera, polycythemia rubra, splenomegalic polycythemia, myelopathic polycythemia, polycythemia with chronic cyanosis, erethrocytosis megalosplenica, and polycythemia hypertonica by Gaisböck. These names are gradually being superseded by the more appropriate and descriptive term "erythremia," which was first suggested by Türk, of Vienna. As Osler[9] stated in his third paper on the disease in 1908 "it has the great advantage of an analogy with leukaemia, and both affections are associated with states of morbid activity in the bone marrow."

The essential features of the disease were concisely summarized by Osler in his original communication as follows: "The condition is characterized by chronic cyanosis, polycythemia, and moderate enlargement of the spleen. The chief symptoms have been weakness, prostration, constipation, headache and vertigo."

It may not be out of place to state here that it has been the experience of the writer that the great majority of these cases enter the large general hospitals unrecognized and it is not inappropriate, therefore, that the disease should be brought again to the attention of a body of active general practitioners, who are likely to be first consulted by the patient. The affection is oftenest mistaken for hypertensions, chronic Brights, arterio-sclerosis, apoplexy, neurasthenic states and eye affections, which are merely associated manifestations or complications of the disease.

The malady is not as rare as was formerly supposed. It is a peculiar fact that at the Johns Hopkins Hospital, which was opened for the admission of patients in May 1899, and where rather systematic blood examinations have been the rule from the beginning, there were 11,551 medical admissions up to July 11, 1900, before the first case of "polycythemia" was diagnosticated. This was Case II in Osler's original series, Case I being a patient in his private practice. From this date on the cases became more numerous, as attention became riveted on the disease. Up to May 1st, 1924, there have been 32 cases admitted to the wards out of a total of 51,080 medical admissions. I have analysed these cases and reference will be made to this series

in the text. In the brief time at my disposal no attempt is made at a thorough discussion of the affection, only salient features being dealt with.

The cases of polycythemia may be divided into two groups:—

(1) Secondary polycythemias, which are dependent on some discoverable cause, and
(2) Erythremia or polycythemia vera.

Under the Secondary polycythemias may be mentioned the following groups:—

(1) Those in individuals in high altitudes, where the hyperglobulism is dependent upon deficient oxygen, resulting in increased activity of the bone marrow.
(2) Polycythemia of congenital or valvular disease of the heart.
(3) Those in association with emphysema.
(4) Those due to concentration of the blood resulting from protracted emesis, diarrhoea, or diuresis.
(5) Those resulting from the action of various organic or metallic poisons.
(6) The experimental acute polycythemia of Lamson following the injection of adrenalin, in which the drug is believed to stimulate the liver to give up its reservoir of red cells to the general circulation.

It is with erythremia or polycythemia vera, in other words with the cases in which there is an actual overproduction of red cells, that we are concerned in this paper. As experience has accumulated, there has been a tendency to subdivide the cases into various groups. The following sub-divisions have been suggested:—

(1) Cases without enlargement of the spleen.
(2) Cases which appear to be congenital or appear in early life.
(3) The cases of polycythemia hypertonica of Gaisböck. This is a type occurring in elderly patients with hypertension, arterio-sclerosis, cardiac hypertrophy, albuminuria and without splenic enlargement.

It may be well to emphasize here that considerable variation takes place in the size of the spleen in the course of the disease, dependent possibly on increased destruction of red cells which may occur spontaneously. With the increased blood destruction the spleen enlarges. It would, therefore, seem that we should be on our guard in using the size of the spleen as a factor in classifying the cases.

*Sex*: Males are much more often affected than females. In our series there were 25 of the former and 7 of the latter.

*Race*: The colored race appears to experience a relative immunity. There was only one colored case among the 32. The ratio of colored to white admissions is about 1 to 7.

*Age*: Our youngest patient was twenty-one years of age (a colored man), and the eldest was sixty-eight. Divided into decades there were from 21-30, three; 31-40, eleven; 41-50, nine; 51-60, six; and 61-70, three. The largest number, eleven, therefore, occurred in the fourth decade, i.e., between 31 and 40 years. Further, in the fourth and fifth decades, in other words from 31 to 50 years of age, there was a total of 20 cases or nearly two thirds of the total.

*Symptomatology*: It is very difficult to form any clear impression as to how long the affection has existed before the case first comes under observation. It seems probable that it has been present a considerable time before the patient begins to experience subjective symptoms. The initial complaint varies greatly. Headache seemed to be the most frequent symptom in our series. It was a marked feature in 10. Attacks of dizziness are frequent and were emphasized by Osler. This is often accompanied by a sense of fulness in the head and sometimes by roaring in the ears. Visual disturbances, such as transitory dimness of vision or specks before the eyes, are not uncommon. Not infrequently there is a sense of fullness or numbness in the hands. At times there may be transitory weakness in one or other extremity. The patients sometimes complain of a sense of fatigue and an incapacity to perform their ordinary duties. These features, especially if there be accompanying hypertension, frequently lead to an incorrect diagnosis of primary arterio-sclerosis. Pains in the back and cramps in the muscles of the lower extremities are occasionally complained of.

The symptoms with reference to the alimentary tract are very conspicuous. Constipation, often of the most obstinate character, is the most prominent one. It was present in 14 cases. The first patient of the series had not had a movement for 8 days before admission and on one occasion he stated that his bowels had not moved for 14 days. Another patient stated that his bowels moved four times per month. There may be anorexia, nausea and vomiting. Abdominal pain was complained of in twelve.

The vascular features are prominent and are the most serious from the standpoint of risk to life. Moderate or marked thickening of the peripheral arteries was noted in twenty-one. Varying degrees of enlargement of the heart was present in fifteen. Mitral insufficiency, probably always relative, and indicated by a mitral systolic murmur, occurred in eight. Mitral stenosis occurred once, but it was probably dependent upon some previous infection. It is interesting that there was not a single case with aortic insufficiency. It is a significant fact that in 20 cases in which the Wassermann test was done since it came into routine use, there was not a single instance with a positive reaction. As our hospital population shows about 30 per cent with positive Wassermann these negative findings are striking, and, considering the tendency to cardio-vascular manifestations, it may help to explain the absence of any cases with aortic insufficiency. One

patient had an aortic aneurysm with negative Wassermann.

Vascular lesions of the brain were prominent, six of the 32 cases had hemiplegias. Three were right sided and two left. In the remaining case the patient was admitted in an unconscious condition and lived only a few hours. The muscles were so flaccid the side of the paralysis could not be definitely determined. Owing to the slowness of the development of the paralysis, all the hemiplegias were believed to be due to cerebral thrombosis. As further evidence of the proneness of these cases to vascular lesions was the occurrence of extensive bilateral varicose veins of both legs in two cases, which suggested that venous thrombosis had occurred, the development of an acute phlebitis without fever in the last case admitted, and the existence of varicocele in two others. One patient had a mesenteric thrombosis terminating fatally after operation.

That the disease is not by any means constantly accompanied by hypertension is shown by the fact that, when one considers the age of the individual patients, there were only 12 in which the blood pressure was increased. The highest systolic blood pressure was 240 mm. of Hg. in a woman. The highest diastolic pressure was 150.

With reference to the renal system, albuminuria of varying degree was present in every case. Hyaline and granular casts occurred in 21. These urinary findings not infrequently lead to a diagnosis of nephritis. Phthalein determinations were recorded in 7 cases. In 5 there was a diminished output ranging between 15 and 43 per cent for 2 hours; normal in 2. Diabetes occurred in 2 cases. In a third case, the patient with mesenteric thrombosis, in which the autopsy showed thrombosis of the portal radicles in the liver, glucose was present in the urine.

Haemorrhages not infrequently occur. One of our series had a severe haemoptysis without any physical signs of tuberculosis. Haematemesis has been recorded. One of our cases had a severe gastric haemorrhage but there was a very suggestive history of duodenal ulcer. A severe haematuria occurred in one of the cases before admission, and three other cases had red blood cells in the urine on microscopic examination. Another case recently had an annoying haemorrhage from a ruptured venule on his face. Bleeding from the nose and gums, haemorrhages into the brain, the pleural and peritoneal cavities, and into the skin or subcutaneous tissues have been recorded.

Osler has pointed out the tendency to pigmentation of the skin in these cases with prolonged cyanosis.

### Physical Signs

(1) *Cyanosis.* Although chronic cyanosis is a constant and conspicuous feature of the disease, it is rarely mentioned by the patient among his symptoms. The color is usually very striking. The patients usually present a cherry-red color of the face and hands. The backs and palms of the hands often show a red brick-dust tint. In some there is a suggestion of a plum-blue hue to the face and hands. When one studies the color more closely one will find that it is contributed to by various degrees of dilatation of the venules of the face, ears, hands, and often also of parts of the trunk. The venules of the lips, buccal mucous membrane, tongue, pharynx, inner surface of the eyelids and sclerotic coats of the eyes show the same dilatation. Ophthalmoscopic examination reveals the same changes in the fundi with marked enlargement of the main venous trunks. It is this venous dilatation that is so characteristic of this type of cyanosis. In every full-blooded, plethoric looking individual, close inspection of the condition of the venules should be made. Presence of innumerable dilated venules should put us on our guard and lead us to have a full blood count made, with the probable result that a polycythemia will be found. Cold tends to increase the cyanotic tint. Raising the hand above the head often causes prompt blanching, with a sudden return of the color on lowering it. The stasis is well seen in the dependant feet.

(2) *Splenomegaly.* Enlargement of the spleen is found in a certain proportion of the cases. It is not by any means a constant feature, as has already been intimated. It was enlarged in 19 of our series. The degree of enlargement varied greatly from a merely palpable gland to one which extended 15 cm. below the nearest point of the costal margin. The enlargement of the spleen is probably in part analagous to the splenomegaly in myelogenous leukaemia, but is probably also in part due to the increased blood destruction it is called on to perform, as Weber[10] has pointed out.

(3) *Enlargement of the Liver.* The liver may show moderate enlargement in a certain percentage of cases, even when it cannot be explained on the basis of a chronic passive congestion due to associated cardiac disease.

(4) *Polycythemia.* The study of the blood constitutes the most interesting and important aspect of the malady. Time will not permit more than a brief reference to the salient features, as I hope that Dr. Minot, who has made it a special subject of investigation, may treat this phase of the disease more in detail in the discussion.

The outstanding feature of the blood picture is the striking increase in the number of red cells which occurs at some period during the course of the disease. The count varies in each individual case, as the patients show a tendency to spontaneous remissions and relapses. The highest count in our series was 13,200,000. The average of the highest counts on any of the ad-

missions was 8,873,000 in the 32 cases. The highest red count I have seen recorded was 14,800,000 per c. mm. in a case published by Tancre

There is frequently a considerable leucocytosis. In only 6 was there a normal count. The lowest count was 4,800; the highest 45,750. The average of the highest counts recorded in each of the 32 cases was 15,426 per c. mm. The characteristic feature in the differential blood count seems to be a slight increase in the polymorphonuclears. In 26 of the 32 cases in which there were records of differential counts the percentages were as follows: small mononuclears, 15.2; large mononuclears, 4.1; transitionals, 0.7; polymorphonuclear neutrophiles, 79.2; eosinophiles, 1.5; basophiles, 0.5. Other interesting findings in the differential counts were the fact that in one case 2 normoblasts, and in two cases 1 megaloblast was observed in each. In six, occasional myelocytes were found. In one case 2 per cent of neutrophilic myelocytes were observed.

Although the statement in our differential counts was usually to the effect that the red cells showed no changes, microcytosis and macrocytosis, achromia and polychromatophilia of the red cells have been noted, as described by Minot and Buckman. In one of our cases studied by Lamson 9 per cent of reticulated red cells were found.

The platelets have been recorded as diminished, normal or increased. The general impression, when accurate counts by reliable methods have been made, is that they are increased. There are only two counts recorded in our series. One showed 252,000 and the other 400,000, the latter showing a moderate increase.

The haemoglobin usually shows a striking increase. It generally ranges between 120 to 150 per cent. The highest record of our series is 220 per cent. Although this patient had 12,800,000 red cells, one would be strongly inclined to doubt the accuracy of the Sahli instrument used. Bock and Means, however, have also recorded a case with 220 per cent. The next highest determination was 175 per cent. The average of the highest determination in our 32 cases was 124 per cent. The color index of the blood is below normal and was 0.7 in our series.

The total volume of blood is increased in erythremia. By the Haldane and Smith[11] carbon monoxide method, the reported figures have reached as high as three times the normal figure corresponding with the patient's weight. Bock and Means have confirmed this increase. In one case the blood volume by the vital red method was 8,545 cc. or 124 cc. per kilogram of body weight instead of the normal 85 cc. In another, the blood volume was 6.659 cc., or 118 cc. per kilogram body weight. This increase in blood volume is almost entirely due to the increased bulk of red cells, and not due to an increase of the blood plasma. This can be demonstrated by the haematokrit as well as by the total plasma volume. Normally the corpuscles represent about 46.8 per cent, and the plasma about 53.2 per cent of a volume of blood, while the total plasma volume is between 42 and 56 cc. per kilogram of body weight. In erythremia, if the blood is allowed to stand for several hours, almost no plasma comes to the surface, and if the haematokrit is used, the figures may reach 73 per cent of cells and 27 per cent of plasma.

As to the physical characteristics of the blood, it appears very dark as it flows from the point of puncture. The specific gravity and viscosity of the blood are considerably increased. The coagulation time of the blood seems to vary, being increased or diminished according to various observers, without having any direct relationship to variations in the red count. The time was not increased materially in the cases in our series in which it was tried.

With regard to the fragility of the red cells Minot and Buckman make the following statement:—

"The influence of the polycythemic process on the red corpuscles is evidenced by the deportment of these cells when placed in hypotonic sodium chloride solution and in hypotonic blood serum. These tests show abnormalities indicated below, but do not give necessarily parallel results.

(a) A lengthening of the resistance range is often observed.
(b) An increased, normal or decreased initial hemolysis (point of minimal resistance) may occur.
(c) Complete hemolysis (point of maximal resistance) never occurs in more concentrated solutions than normal.
(d) Patients' cells in dilutions of their own or normal serum may yield an abnormally long resistance span and may break up in dilution of an equivalent of a stronger concentration of sodium chloride than normal.
(e) Normal cells may hemolyze in dilutions of patients' serum more readily than their own. The resistance range in either serum is less than that of erythremic cells.

Hence the erythremic serum may exert a hemolytic influence on red blood corpuscles; in a case of erythremia, some of the cells may be more vulnerable than normal and others distinctly less so.

It is suggested that lengthened resistance span in fragility tests is due to cells of a greater age variety than normal; that an increase of resistance, especially the maximal resistance, is dependent upon an increase of some of the immature cells; and that decrease of minimal resistance is indicative of some hemicidal influence on the cells, or perhaps due to a rela-

tively large number of old or pathological cells.''

As in leukaemia, so in erythremia it has been found that the metabolic rate is increased. A satisfactory explanation for the increase has not been advanced up to the present, but it is believed to be due to the hyperactivity of the bone marrow.

With regard to gas exchange I quote the following from Fitz:—''The volume of air breathed per minute tends to be increased, as shown in the cases reported by Senator and by Means and Bock, which varied between 8 to 5 liters and 11 and 5 liters, figures considerably in excess of the average normal. Thanks to such ventilation, the arterial blood is normally saturated with oxygen (98 per cent in Senator's case and in that of Bergman and Plesch), or approximately so (96 per cent and 93.3 per cent in the cases of Means and Bock), so that owing to the increased blood volume the total oxygen in the arteries is much increased. The need of the cells is no greater than normal, therefore, the venous blood is almost as rich in oxygen as is normal arterial blood, and the 'coefficient of utilization' of oxygen is much reduced. Röver found in one case, which died shortly afterwards, a remarkably low 'coefficient of utilization' and attached great prognostic significance to the finding. His observation has not been confirmed.''

Estimation of the volume output of the heart has given somewhat varying results. Senator reports a case in which it was 65 cc. to the minute, Bergman and Plesch one of 54 cc., and Means and Bock one of 71 cc., all showing either a normal or abnormally high cardiac output. However, as the blood volume is so much increased and the rate of flow approximately normal, the circulation as a whole is relatively sluggish and there is considerable stasis. This may be a factor in causing cases of erythremia to show an increased predisposition to thrombosis.

When followed for long periods cases of erythremia show considerable variations in their blood picture. As noted above, fluctuations in the red count take place spontaneously. Minot and Buckman have recorded three cases, which, after having had polycythemia for several years, developed anaemia, coincident with a further increase in the size of the spleen and a leukaemic blood picture. These cases were all in women who had had erythremia for years with a count ranging between 7,000,000 and 10,000,000. Within the course of a year all three cases had a drop in the red count to 5,000,000 and the haemoglobin to about 85 per cent. Two of the cases before exitus had a fall in the red cells to 2,500,000 and the third case still living had a count of 3,500,000. Nucleated cells became numerous and in one of the cases whose leucocytes rose to 35,000, the differential count simulated strongly a myelogenous leukaemia with 10 per cent of myelocytes.

These observers also noted an increased urobilin output in the stools in these cases, which, with a coincident marked increase in the size of the spleen in all three cases, pointed towards a possible increased blood destruction.

*Etiology and Pathology.* The prevailing view as to the etiology of erythremia is that it is due to a hyperplasia of the erythroblastic bone marrow, just as myelogenous leukaemia is dependent upon a hyperplasia of the leucoblastic tissue. The increased activity of the bone marrow is emphasized by the increase in the peripheral blood of all three formed elements—erythrocytes, leucocytes and platelets, as Minot and Buckman have emphasized. These investigators, as well as Blumenthal[12] before them in 1907, have pointed out an occasional close relationship with myeloid leukaemia. The former observed a typical erythremia case which in its later stages developed an anaemia with a differential leucocyte count suggesting a transformation to a myelogenous leukaemia type with 10 per cent of myelocytes in the circulating blood. In Blumenthal's case the reds were 11,450,000, the haemoglobin 110 per cent and the leucocytes 16,300, of which 45 per cent were myelocytes. At the autopsy the leukoblastic elements of the bone marrow resembled leukaemia more than erythremia. Rosin[13] has recorded a case almost identical with that of Minot and Buckman. On the other hand Winter[14] has presented a case with the converse picture. At the first observation it presented the features of a myelogenous leukaemia with 4,000,000 reds and 22,600 leucocytes. Three years later the patient had 8,000,000 red cells but the white count was unchanged. It has been suggested that both erythremia and myelogenous leukaemia may be of neoplastic nature. The development of the anaemia in erythremia, as in leukaemia, has been suggested by Minot and Buckman as being dependent upon a ''disorderly proliferation'' of the myeloid tissue.

Although the prevailing view is that the polycythemia in erythremia is due to an abnormal increased production of red cells by the hyperactive erythroblastic bone marrow, Richards and Herrman[15], on the basis of a case studied, advanced the view that the hyperglobulism may result from lack of normal red cell destruction, and that this may be due to an abnormally high serum cholesterol content which was present in their case and which they claim preserves the life of the red cells. They claim that cholesterol is strongly antihemolytic, and cite the work of Gorham and Myers who found a low cholesterol content in the blood of pernicious anaemia patients.

At autopsy the bone marrow, grossly, is shown to have retained its fetal red appearance in almost all the bones. Microscopically, it shows,

in addition to congestion, hyperplasia of both the erythroblastic and leukoblastic elements. This was the case in the only patient in our series in which the bone marrow was secured for examination at autopsy. The spleen, though often enlarged from engorgement of blood, is normal histologically.

*Course*: The disease is chronic, lasting for many years, with a tendency to spontaneous remissions and exacerbations, but is ultimately fatal. Patients usually die from intercurrent disease, generally from vascular accidents. Five of our 32 cases died while in the hospital. Three died with hemiplegia due to cerebral thrombosis, one from a mesenteric thrombosis, and in the fifth the cause could not be definitely determined as no section was permitted. Death was preceded by great asthenia but was not apparently due to cerebral or cardio-vascular complications.

*Treatment*: The treatment is, on the whole, unsatisfactory and essentially palliative. The measures used, as in myelogenous leukaemia, are purely transitory in their effects, since no agencies adopted up to the present time appear to have any permanent influence on the bone-marrow changes.

Much can be done, however, to relieve the patient's symptoms of headache, vertigo, sense of fullness in the head and hands, etc. The measures that have been adopted may be enumerated as follows:—

(1) *Splenectomy.* This has been abandoned owing to its failure to give either transitory or permanent results.

(2) *Oxygen.* Oxygen inhalations have been tried without very satisfactory results.

(3) *Venesection.* The repeated removal of from 500 to 800 cc. of blood almost invariably gives material relief to the subjective symptoms and may cause a decided drop in the cell count. It was carried out in 9 of our cases. The best results were obtained in a woman who entered with 10,304,000 reds, 16,000 leucocytes and 130 per cent of haemoglobin, who, after several bleedings to a total of 2,400 cc., left the hospital with 5,112,000 reds, 18,000 leucocytes and 95 per cent of haemoglobin and with decided improvement in the subjective symptoms.

(4) *Radium and x-ray therapy to the long bones and spleen.* In two of our cases radium treatment of the spleen and in two deep x-ray treatments of the long bones were applied with temporary improvement in the subjective symptoms and blood count. It would seem that best results would naturally follow the treatment of the long bones.

(5) *Benzol.* Since Korany introduced benzol as a means of treating myelogenous leukaemia on the basis that it reduced the activity of the hyperblastic bone marrow, this drug has not infrequently been prescribed in erythremia, with the view of retarding the formation of new red cells. It often has a striking effect on the blood count. McLester has reported satisfactory results. It was used in three of our series with material reduction in the red cells.

In one of my personal cases included in the series, a combination of venesection, deep x-rays to the long bones and benzol was utilized. Although on his first admission he had 7,880,000 reds, 10,500 leucocytes and 133 per cent of haemoglobin, he had already shown some spontaneous improvement on his third admission without treatment. His count then was 6,100,000 reds, 5,900 leucocytes and 105 per cent haemoglobin. The above combined treatment was then started and at the end of a month he left with 4,310,000 reds, 5,000 leucocytes and 85 per cent haemoglobin. He felt infinitely better and the cyanotic, congested appearance had almost entirely disappeared. Without further treatment he returned eleven months later with 5,568,000 reds, 10,000 leucocytes and 105 per cent haemoglobin and feeling better than he had for years. This patient before his second admission had had a hemiplegia with motor aphasia from cerebral thrombosis from which he almost entirely recovered. Before his first admission he came to us with a diagnosis of chronic Brights.

Should benzol be used, the precautionary advice must be given to watch the leucocyte count in order that a marked leukopenia be avoided.

(6) *Phenylhydrazine hydrochloride.* The use of this drug, which seems to be meeting with considerable favor in the treatment of erythremia, was first advocated by Eppinger and Kloss[16] in 1918. Contrary to the effect of benzol, which is supposed to retard the formation of red cells, these authors believe that phenylhydrazine hydrochloride as well as toluylendiamin increases red cell destruction. They reported striking results in their cases, with a reduction of the count in one case from 9,080,000 reds, 8,000 whites and 150 per cent haemoglobin before treatment, to 3,800,000 reds, no statement as to leucocytes, and 67 per cent haemoglobin after the course was stopped. As evidences of blood destruction were the existence of a slight icterus and an increased urobilin output. They used from 1 to 10 cc. of a 1 to 5% solution of the drug given hypodermatically once daily at intervals of one to three or four days. Later they found that its administration by mouth was equally effective and recommended from 0.1 to 0.3 grams daily.

It is interesting to note that in a case of polycythemia hypertonica of Geisböck it had a striking effect in also reducing the blood pressure. In one case the systolic pressure fell from 200 to 120.

This treatment was carried out in the last case of our series. The patient, a man, aged 46,

was under the care of Dr. T. R. Boggs in the private wards.* He was given 0.1 gram of phenylhydrazine hydrochloride by mouth daily from January 7th, 1924, to January 31st, when it was discontinued. Daily counts were made. On January 7th his blood count showed 7,612,000 reds, 8,000 whites and 145 per cent haemoglobin. For the first two days there was a curious rise in the red count to 10,816,000 on January 9th after which there was a steady fall so that on January 31st the count showed 6,325,000 reds, 10,120 whites, and 135 per cent haemoglobin. The fall in the count continued, however, even after withdrawal of the drug on that date, so that on February 14th it showed 3,300,000 reds, 11,000 whites, and 75 per cent haemoglobin. There was marked improvement in his general appearance and subjective feelings of fullness in the head, sense of tingling, numbness in the hands, etc., and he was discharged from the hospital on March 1st.

It is interesting to note, however, that ten days ago he returned for observation with a recurrence of some of his subjective symptoms and high color and with fresh dilated capillaries on the face and one of these had spontaneously ruptured. His blood count showed a gradual return towards the previous picture, the reds were 6,000,000, whites 7,800 and haemoglobin 105 per cent. Having been impressed with the improvement under the phenylhydrazine treatment he is now being given a second course of 0.1 gram daily. We personally feel that this drug is worthy of being given a trial. One must stop the drug before the count reaches normal for its action seems to continue after its withdrawal and an unnecessary anaemia must be avoided.

It may be finally stated that, although various measures may be efficacious in the treatment of this interesting disease, their action is transitory and effect purely palliative, as experience seems to show that no matter what measure is adopted there is a tendency of the blood count to rise later and for the subjective symptoms to return.

*This case will shortly be reported in detail by Dr. Trevor Owen.

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## Discussion

Dr. R. Fitz, Boston: Dr. Futcher has covered the subject of erythremia so perfectly that there is but little left for discussion. Certain practical points of his paper, however, may be worth emphasizing.

In discussing erythremia it is important to remember that the term should properly include only those cases of true polycythemia with cyanosis of unknown cause and an enlarged spleen described by Osler and Vaquez. This disease, as Dr. Futcher has stated, is rare.

The eye-grounds of these cases are often characteristic and help to establish the differential diagnosis between erythremia and some other condition complicated by a secondary polycythemia.

The examination of the blood is most important. To establish the diagnosis, the hemoglobin concentration must be high, estimating it by a more accurate method than by the Talquist scale which will not register a hemoglobin concentration over 90%, and a high red count is necessary.

Here are three samples of blood which show the differences in hemoglobin content found in a normal, an anemic, and a polycythemic blood. (Showing) Equal volumes of these bloods were diluted with decinormal hydrochloric acid as in the Sahli hemoglobin method. The normal blood was diluted with one hundred volumes of acid to serve as a control. The anemic blood only required twenty-five volumes of acid to develop a color equal to that of the normal acidified blood, while the polycythemic blood required one hundred and fifty volumes of acid. These figures give an idea of the differences in hemoglobin concentration found in anemia and erythremia.

Another characteristic of polycythemic blood is the relatively high proportion of cells per unit volume. Here are three samples of oxalated blood which have been centrifugalized at the same speed for the same length of time. (Showing) You will see that the normal blood has about forty volumes per cent of corpuscles and sixty volumes per cent of plasma. The anemic blood has twenty volumes per cent of corpuscles and eighty per cent of plasma. The erythremic blood, on the other hand, has eighty volumes per cent of corpuscles and only twenty volumes per cent of plasma. Such a high corpuscular volume is characteristic of erythremia and combined with a high hemoglobin concentration and a high red count is typical.

Dr. Henry A. Christian recently brought out in an interesting way the possible similarity in symptoms between erythremia and pernicious anemia. It happened that a patient with pernicious anemia lay in the next bed in the hospital to a patient with erythremia whom he had just examined. The patient with pernicious anemia

complained characteristically of weakness, loss of strength, numbness and tingling in the hands and feet and indefinite digestive symptoms. As Dr. Christian remarked, the patient with erythremia had exactly these complaints so that the history of the patient with pernicious anemia fitted perfectly the history of the patient with erythremia, yet one had a red blood count of less than one million and the other a red blood count of about nine million. Dr. George R. Minot has also made observations suggesting certain relationships between erythremia, leukemia and anemia.

From the point of view of prognosis and treatment the natural course of erythremia is important. As Dr. Futcher has stated, the disease is chronic, liable to spontaneous relapses and remissions, but is eventually progressive and fatal.

My personal experience with the treatment of erythremia is very limited. I have seen benzol or repeated bleedings used with perhaps a certain amount of subjective benefit. The drugs which Dr. Futcher has mentioned appear to offer more promise of relief to future cases. Also, deep X-Ray therapy has been used beneficially in certain instances.

In conclusion, I think it important to emphasize once more that erythremia is a rare disease. One should be sure of the diagnosis before subjecting patients to a prolonged treatment designed to diminish the amount of circulating blood. Such treatment might be harmful in the management of secondary polycythemia which so commonly accompanies such conditions as congenital heart disease, chronic bronchitis and emphysema, or chronic myocarditis. It is of great importance, therefore, to remember that erythremia is a disease entity. It is a disease of unknown origin, characterized by an over production of red cells and an increased blood volume, it bears certain relationships to other diseases of the blood forming organs, and it is entirely different in its course and etiology from secondary polycythemia due to a known cause.

(No further discussion.)

## THE SIGNIFICANCE OF DISTURBANCES OF MICTURITION*

BY GEORGE GILBERT SMITH, M. D., F. A. C. S.

AMONG the cases encountered in a general practice, a considerable proportion complain, at some time or other, of disturbances of urination. It is the purpose of this paper to review this subject from the point of view of symptomatology chiefly, and to analyze the factors underlying the distressing symptoms.

In the discussion of each symptom, the diseases with which it is usually associated will be mentioned, and the appropriate treatment will be outlined as far as is possible in so limited a time.

*Frequency of urination.* It is difficult to say how frequent the desire to void must be, to be termed abnormal. Individuals differ in the capacity of their bladders. The rapidity with which the bladder fills depends upon the amount of fluids ingested, and upon the condition of the nervous system as regards the readiness with which it responds to stimulation. Chilling of the surface of the body or of the feet appears not only to increase the rate at which the urine is secreted, but to increase the irritability of the urinary reflex. This latter effect is believed to be due to local congestion in the region where the reflex is originated—that is, at the neck of the bladder and in the proximal portion of the urethra. Transient frequency of urination cannot be called pathological. When however the desire to void occurs regularly oftener than once in three hours, when it wakes one from sleep more than once in a night, it may fairly be termed abnormal.

Let us now inquire into the conditions which bring about a frequent desire to void. At first sight they seem to be many; upon closer analysis, they appear to depend for their effect upon a few underlying factors. The bladder itself is not a very sensitive organ, provided its activities be confined to their normal bounds. The mucosa, unless inflamed, is very elastic and relatively insensitive. The detrusor muscle, if distended beyond its normal limits, attempts to express the contents of the bladder. These contractions of the already stretched muscle are probably the cause of pain which is present under such conditions. If obstruction exists, such as is caused by an obstructing prostate or a stricture of the urethra, a small amount of urine may be passed with resulting relief. This relief is but short lived; as the difference between the amount of residuum and the normal capacity is small, distension soon reoccurs, and thus a frequent desire to void is created. The muscle of this "overflow" bladder, as it is termed, first hypertrophies, then becomes paralyzed, so that the later stages of chronic overdistension may be free from all symptoms. If the process has been gradual enough, the patient may never have experienced pain at all.

The wall of the normal bladder possesses remarkable elasticity. Consider its ability to expand from a cavity containing practically nothing to one which holds sixteen, twenty, or even

*Read before the Greater Boston Medical Society, May 13, 1924.

twenty-four ounces, without arousing the desire to urinate. Whenever pathological changes occur in that wall which interfere with its elasticity, a painful sensation is aroused, resulting in a desire to void. Such changes occur, I believe, in acute cystitis. Caulk[1] in Cabot's Modern Urology, says, speaking of acute cystitis, "In a study of forty bladders postmortem, Motz and Denis found that the epithelium had preserved its characteristics.—The changes in the mucosa and submucosa depend upon the character and duration of the infection. In very mild cases the process may be entirely superficial with swelling and edema of the epithelium and with desquamation of the superficial cells. At a later period, the mucosa becomes infiltrated with leukocytes and traversed by numerous dilated blood vessels. In the early stages the submucosa may show no changes. As the process progresses, the submucosa becomes invaded by vascular dilatations and engorged with blood, and may be studded with scattered collections of leukocytes producing minute superficial abscesses. This process is entirely limited to the submucosa; the musculature is not involved, the submucosa being freely movable over it." The acutely inflamed mucosa resents any change in its position; not only is distension painful, but collapse is almost equally so. Every alteration in the amount of fluid in the bladder causes pain and, since bladder pain is normally associated with overdistension, an immediate desire to void is aroused. As the edema and inflammatory infiltration of the mucosa and submucosa subside, the bladder again becomes tolerant, even though the urine be full of pus. Chronic cystitis is often not accompanied by frequency.

In acute inflammatory conditions, relief is obtained by the use of those old surgical measures —rest, elevation, drainage—and by the employment of alkaline diluents, such as cream of tartar water, potassium citrate, and by no means least, copious amounts of plain water. Sandalwood oil is soothing, urotropin is irritating. With the patient lying quietly in bed, the bladder escapes the influence of pelvic congestion which is always present when we are on our feet, and is spared the jarring which must take place with every step we take. In severe cases, it may be desirable to secure even greater degree of rest by draining the urine through an indwelling catheter.

If, instead of subsiding, an inflammatory process involving the submucosa goes on to the development of round-cell deposit and the formation of areas of fibrosis, the section of the vesical wall involved loses its elasticity. The mucosa becomes firmly adherent to the underlying layers, and distension of the bladder wall beyond a limited degree sets up painful sensations. If the distension is increased, the mucosa cracks and bleeds, just as a healing herpes on the lip cracks when the lip is stretched. Through the cystoscope one can see these cracks appearing over the affected area if the bladder be overdistended. They have somewhat the same appearance as the striae on a pregnant abdomen. Such a condition is met with in long standing cases of tuberculosis of the bladder. Long after the active infection has disappeared, even when the urine is clear and the bladder mucosa healed, these cicatricial areas beneath the surface may persist and cause frequency of urination because the distension of the viscus beyond a very limited amount arouses a painful sensation.

Nor need such areas be extensive. In the so-called "elusive ulcer" desribed by Hunner, better termed submucous fibrosis, the area of fibrous deposit may be only a few cm. in diameter. Such areas, however, may curtail to a marked degree the normal elasticity of the bladder wall. Obviously, if the bladder resents distension of more than four ounces, one has to void twice as often as if it held eight ounces.

Induration of the bladder wall, involving the submucosa chiefly, and reducing the elasticity of the vesical wall, is the outstanding factor in frequent urination so far as the bladder itself is concerned. This condition may be due to numerous causes—ulceration, tuberculosis, infection, stone. The urine may contain signs which point to the diagnosis, such as pus, blood or tubercle bacilli. On the other hand, it may contain no abnormal elements, or at most a few red blood cells. The introduction of a catheter and gentle distension with boracic solution will indicate the degree to which it can be distended with comfort. A contracted bladder accompanied by essentially normal urine points to a previous tuberculous or a long-standing pyogenic infection, or to an interstitial fibrosis. Much blood of course suggests tumor or stone. Every case in which the diagnosis is not evident should be subjected to cystoscopy, a procedure which is very simple and easy provided an observation instrument of small calibre be used.

As regards the treatment of interstitial fibrosis, when confined to limited areas, Hunner at first advised excision of the entire lesion. The section of bladder wall in which the fibrosis was located was removed. The late results of this operation, however, have not been satisfactory as recurrence has often taken place. Braasch and others now advocate fulguration of the bladder wall through the cystoscope. This must be done under an anaesthetic as the destruction of tissue must be carried through the submucosa and must destroy practically all of the dense scar tissue.

I have excised such a lesion in one case. The portion of the bladder wall removed showed a very small ulceration at the center of the lesion, but beneath the surrounding mucosa the submucosa had been changed into a dense, white, cicatricial layer. The patient was much relieved for a few months, but her symptoms later recurred and cystoscopy showed an apparently

similar condition to the one excised lying close to the scar of the preceding operation.

There are other causes of frequency, however, besides those originating in the bladder. These other causes have to do with the condition of the bladder neck and the proximal urethra. Let us remember that the normal reflex of urination is set up by the escape of a few drops of urine past the internal sphincter into the posterior portion of the urethra. The presence of the urine sets up a contraction of the detrusor muscle and a relaxation of the internal sphincter. If the voluntary muscle of the external sphincter is then relaxed, urination takes place. If not, the reflex subsides. The situation appears to be more complex in the male, because of the intervention of the prostatic urethra between the two sphincters. In the male, therefore, we find a type of urinary disturbance having to do with the condition of the posterior urethra, which has no exact prototype in the female. The relation of causes and effects is here not quite so clear cut. There are numerous conditions resulting in frequency about which we can only speculate. Even these, however, can probably be safely divided into two main divisions—i. e. those dependent upon congestion, with increased irritability of the nerve endings through which the urinary reflex is initiated, and those dependent upon incomplete closure of the internal sphincter, with a consequent easy escape of urine into the posterior urethra. Probably both factors occur together in many instances. However that may be, the conditions in which we find a frequent desire to void attendant upon changes about the prostatic urethra are as follows: early adenomatous changes in the prostate, associated with marked congestion of the gland and the mucous membranes adjacent; fibrosis of the prostate, causing a stiff, inelastic urethral orifice and thereby allowing the easy escape of urine into the prostatic urethra; prostatitis, acute and chronic, both, the former probably operating more through congestion, the latter more through stiffening of the bladder orifice; lesions of the prostatic urethra, such as ulcerations, papillomata and pathological conditions of the verumontanum. The last group in all probability excites a frequent desire to urinate by stimulating the nerve endings of the reflex arc. We see this reflex aroused very violently when we apply a caustic to the mucous membrane covering the floor of the prostatic urethra. Some prostatic condition should be suspected when the second urine is normal, the bladder capacity not limited, and the prostatic urethra unduly sensitive upon the passage of a moderate sized sound.

If rectal examination shows a large, elastic prostate, one may suspect early adenomatous changes; if the prostate and vesicles are firm and their secretion as expressed by massage shows more than 4 or 5 leukocytes per field, prostatitis may be regarded as the underlying cause. In doubtful cases, the information disclosed by endoscopy will prove very helpful. I have seen half a dozen cases of chronic prostatitis, some of whom, be it noted, never had an antecedent gonorrhoea, who complained of marked frequency, whose prostates were as hard as wood. The secretion contained very little pus. Yet under persistent massage and dilatation, the induration decreased and the symptoms disappeared.

A typical case is that of J. H. S., a jeweller of 29. He had been married five years, had one child and during the time he was under observation his wife again became pregnant. He had never had venereal disease. About one year before I saw him he had an attack of frequent urination. This had continued and, at the time of his first visit, he had a frequency during the day of every half hour. He never had hematuria and his sexual powers were normal. Strange to say he had no nocturia. The urine was clear, 1012, showed an s.p.t. of albumin, no sugar, 10-12 r.b.c. per field and a rare leukocyte. Prostate was thickened anteroposteriorly, very hard, slightly irregular. The vesicles were not palpable. Prostatic secretion showed 12-15 leukocytes per field. He had no residuum. Endoscopy showed a normal bladder trigone. The posterior urethra was congested. The veru was rather large with granulation tissue on either lateral wall. Following endoscopy his symptoms improved so that he could hold urine for a couple of hours. He was given an instillation of strong silver nitrate and at the next visit was dilated wth the Kollman to 35 French. Within a month he was able to hold his urine 4 hours. Massage and dilatation were kept up at weekly intervals for three months. He then stayed away for 2 months with gradual recurrence of the frequency. He has now been under observation and occasional courses of treatment for a year. His prostate is definitely smaller but is still extremely hard. He holds his urine from 3 to 4 hours.

Carcinoma of the prostate is usually surprisingly free from local symptoms until the disease has invaded the prostatic urethra, or has caused obstruction.

Lesions of the urethra distal to the external sphincter have no effect upon the frequency of urination unless, like strictures, they cause obstruction.

The female urethra, from the point of view of its symptomatology, would appear to occupy a position midway between the anterior and the posterior urethra of the male. It is much more richly supplied with sensory nerves than is the anterior male urethra. Congestion and inflammation set up a train of symptoms closely resembling those caused by affections of the prostatic urethra in man.

A low-grade inflammatory condition of the female urethra, called by Le Fur[2] "chronic interstitial urethritis," is very often the cause of

frequent and burning or painful urination. Pain during and after voiding is perhaps a more predominant and more constant symptom than frequency, but the latter is usual enough for us to consider this condition as one of the causes of frequent urination. This condition is often diagnosed as "irritable bladder" or cystitis, whereas the bladder is really perfectly normal.

The cause of this lesion cannot always be determined. Very frequently it results from a preceding pyelocystitis; sometimes it follows a gonococcus infection. Noguès[3] has studied at autopsy several cases of this type. He found slight changes in the epithelium with infiltration of cells directly beneath; a massing of leucocytes, and, in some cases, areas of necrosis. Le Fur[2] has found a sclerosis of the blood-vessels in the layer of erectile tissue which surrounds the urethra, lying between the muscular coat and the mucosa. A presumptive diagnosis is easily made. If a catheter specimen of urine is normal, save for a few leucocytes, and the bladder can be distended to a capacity of 300 ccm., one is fairly safe in attributing the symptoms to the urethral condition. The diagnosis may be made certain by cystoscopic and endoscopic examination; the bladder is normal, or shows congestion and bullous edema of the trigone and mucosa covering the sphincter; the urethra, viewed best with the patient in the knee-chest position, shows areas of beefy redness, and bleeds easily.

The treatment consists of dilatation of the urethra with sounds or the Kollman dilator, irrigation with weak silver nitrate, and the application of 10% silver nitrate through the urethroscope.

A case which illustrates the extreme discomfort suffered by the patient and the great relief obtainable by proper treatment is that of Miss A. B., age 52, who came to me in January, 1924, complaining of bladder trouble. This began about ten years before, apparently as an attack of acute cystitis. Since then the symptoms have recurred in attacks which have gradually increased in severity. She now has to get up three times at night and says that her life is miserable because of the pain which she suffers whenever she voids. Her general condition is good. The urine is clear, no albumin, no sugar, no pus. The bladder holds 10 oz. easily. Upon cystoscopy, it appeared normal except for the engorgement of the capillaries about the trigone and bullous edema surrounding the bladder neck. Pelvic examination negative. She felt much better after cystoscopy. At the next visit endoscopy was done. The urethral mucosa, in the distal two thirds, appeared purplish and edematous. The trigone and urethral mucosa were cauterized with strong silver nitrate. A severe local reaction occurred, causing much pain for six days; after that the patient began to feel better and improved every day. She has had nine treatments since then, consisting of filling the bladder with a solution, at first boracic acid, later silver nitrate, and dilating the urethra with sounds to 30 and with the Kollman to 31F. At the last visit, she stated that she felt practically well; she occasionally got up once at night and many nights did not have to urinate at all. She is to report whenever she has any recurrence of the symptoms and, as a precautionary measure, is to avoid those foods which are known to have an irritating effect on the bladder such as rhubarb, tomatoes, asparagus, and spices.

Not all cases respond as quickly to treatment. In some women the condition appears to be kept up by recurring showers of colon bacilli in the urine. I have under observation two such cases, in both of whom catheter specimens from the ureters showed no pus, whose pyelograms were normal, but who have recurrent attacks of bacilluria followed by pus in the urine and recurrence of the urethral symptoms. In one of these there is marked obstinate constipation; in the other the attacks appear to be associated with intestinal disturbances. Although their symptoms are much relieved by local treatment, I do not believe that they will ever become entirely well until the absorption of bacilli from the intestinal tract ceases. Both have been treated with autogenous colon vaccine, but it is too soon to say whether this has succeeded in raising their resistance to the organism.

*Pain.* Pain in connection with urination may occur before, during or after the act. When it occurs before urination, it is most probably due to loss of elasticity, actual or relative, of the bladder wall. If during urination, it is caused by urethral lesions; if it follows urination, it may be due to the collapse of a stiffened bladder wall, to the gripping down upon a stone, or to urethral lesions stimulated by the passage of urine.

Bearing in mind the pathology of the lower urinary tract as described in the paragraphs on frequency, one can readily see how many of these conditions would also cause pain. A careful cross-questioning of the patient will often elicit information which will lead to a correct diagnosis of his symptoms.

At this point it may be well to mention a cause of frequent, painful micturition which was described by W. W. Duke in the *Journal of Urology* for August, 1923[4]. Duke ascribes certain cases of irritable bladder to food allergy, and reports a number of cases in which he seemed to prove that attacks of painful urination were produced by the ingestion of, or inoculation with, certain food substances.

*Dysfunction.* In connection with the symptoms of frequent and painful urination, or often unaccompanied by them, one may meet with mechanical disturbances of urination—incontinence or obstruction. Incontinence may of

course be due to diseases of the reflex arc, such as tabes, multiple sclerosis, transverse myelitis, or encephalitis lethargica. Or it may be due to weakness or destruction of the sphincter muscle. In women, this condition is usually due to child-birth. It can usually be relieved by the operation of reefing the sphincter and re-enforcing it by suturing over it a fold of detrusor muscle. This is done through an incision in the anterior vaginal wall. Cases of slight incontinence may be helped by gentle dilatation of the urethra, this result being due to the absorption of inflammatory infiltrations and the consequent increased tone of the sphincter. Incontinence in the male, unless due to congenital defect, is caused by nerve lesions, operative injury, or an overflow bladder.

Obstruction to urination is not often found in women. When it does exist, one may suspect a nerve lesion, or some local cause such as stricture of the urethra or tumor of the bladder. Carcinoma of the urethra is easily detected upon examination.

In men, obstruction may be due to these same causes, or to a prostatic condition. Diverticulum should be thought of if the bladder neck and urethra are free, and nerve lesions are ruled out. If retention is due to nerve lesion, it is much better to empty the bladder by suprapubic pressure than by catheterization. During the war it was discovered that distended bladders following lesions of the spinal cord could be emptied in this way. After a time, the lower spinal centers are likely to assume control of the urination reflex, and to empty the bladder automatically when distension reaches a certain point.

This rather brief summary of conditions of the lower urinary tract about which one could easily write an entire book will not have been in vain if it has simplified to any degree the interpretation of the symptomatology of the disturbances of urination. The diagnosis of these conditions is fascinating, and if correct, will in many cases enable the physician to institute simple measures which will give great relief. Without decrying the scientific work of the laboratories, and most certainly without underestimating the great value of cystoscopic examination, let me recall to your attention the fact that the practice of medicine in this branch as in all others should be founded upon actual facts from which logical conclusions have been drawn. In urology, many of these facts are as accessible to the practitioner as they are to the specialist. Thorough examination of the urine, which in the case of women must always be obtained by catheter to avoid the contamination of the vaginal secretions, and the determination of the bladder capacity, which can be done at the same time, will give definite knowledge as to whether one is dealing with an infection or not. There seems to be an entirely unfounded dread of the results of catheterization. Boil the catheter, wash your hands, leave an antiseptic solution such as mercurochrome 1-1000 or potassium permanganate 1-5000, in the bladder, and you need never fear that infection will result unless the bladder was overdistended. Do not empty bladders which contain over 30 ounces. The sudden collapse causes intense congestion of the vesical wall, with resulting infection and sometimes with alarming hemorrhage. Rectal examination in men over 45 will disclose some cases of early malignancy of the prostate, and will enable them to derive the benefits of its radical removal.

A careful history, a weighing of the symptoms, a knowledge of the true condition of the urine, will enable one to make a very shrewd guess as to the diagnosis in a large proportion of these cases.

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## BOOK REVIEW

*The Culture of the Abdomen.* By F. A. Hornibrook. Preface by Sir William Arbuthnot Lane, Bart., C. B., M. S. William Wood and Company, New York. 1924. Pages 67.

The author, who states that he is a masseur, found himself confronted with "the piling on of adipose tissue in later life." He set himself "to designing an entirely new system of physical exercise,—a method whereby it is possible to localize effort to the abdominal region, to promote more internal abdominal activity, and to concentrate on correct posture. The system, as perfected by me, is presented in this book."

On examination, one finds that this "system" consists of 8 exercises, described by photo and text. Actually, of the whole 67 pages of the book, about ten pages of text suffice to set forth the 8 exercises of the system. These exercises should prove helpful for the purpose intended.

The first 50 pages of the book are devoted, not to the 8 exercises of the "system," but to a discourse on hygiene. This is well enough, but somehow when the masseur dispenses physiology, one could wish he had profited by that ancient admonition to "let the shoemaker stick to his last."

Since however all well-directed effort is better than none, the reviewer heartily commends this booklet to the attention especially of all those who with the author may feel themselves confronting the drab fate of "piling on adipose tissue in later life,—men in front and women behind."

# Case Records of the Massachusetts General Hospital

ANTE-MORTEM AND POST-MORTEM RECORDS AS USED IN WEEKLY CLINICO-PATHOLOGICAL EXERCISES

EDITED BY

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## CASE 10331

An American widow of fifty-five was sent from the Emergency Ward May 22, very ill. The complaint was abdominal distension and pain. Most of the history was given by the surgeon who sent her in.

F. H. and P. H. not obtained, except that two weeks ago she had scabies.

P. I. Three years before admission she had radium treatment for fibroids at a hospital. She seemed to do well until a month before admission, when she began to feel "run down" and noticed some bloating of the abdomen. The symptoms did not become very severe until a week ago, when the distension began to increase markedly and there was increasing constipation and more or less severe general abdominal pain, probably worse on the left side. During the past forty-eight hours all the symptoms had been marked and she had had frequent vomiting or retching. A nurse who had been with her twenty-four hours said that two enemas brought only small gas results.

P. E. A fairly well nourished woman, apparently acutely ill, restless, complaining of abdominal pain, and at times apathetic. All but a few teeth false. Chest expansion limited. *Lungs.* Dullness extended more than normally high up at the bases. *Heart* not recorded except a somewhat ringing valve-like first sound. *Abdomen* markedly distended. Dull to flat except in upper portion. Doughy and resistant. Tenderness. A probable mass in the left lower quadrant. *Rectal examination.* A distinct mass, more to the left side. *Extremities, pupils* and *reflexes* normal.

*T.* 99.2° at entrance, gradually falling to 96°, with a terminal rise to 99.9° the day of death. *P.* 80-113. *R.* 48-10 (morphia). *Urine.* Amount normal on the one occasion recorded, cloudy, sp. gr. 1.018, a large trace of albumin and rare leucocytes at the one examination. *Blood* and *Wassermann* not recorded. *Vomitus.* Green fluid. Guaiac negative. *Skin consultant.* "Pruritus, probably of internal origin. Certainly this is not scabies. Treatment, liq. carbonis detergens ℥ ii, water ℥ xvi. Sop on for itching 4 i.d. or oftener if needed."

May 23 the patient seemed better, and had normal temperature and pulse. The distension was about the same as at admission. Enemata gave good gas results. There was no vomiting. Two days later there was more distension and she complained of abdominal pain, was quite dyspneic, and looked much worse. She vomited occasionally. Enemata gave no results. Operation was advised, but the patient preferred to die without it. The treatment was merely to keep her comfortable. She required increasing amounts of morphia. The distension increased. May 28 she died.

### DISCUSSION

BY DR. RICHARD C. CABOT

#### NOTES ON THE HISTORY

We have here intestinal obstruction. The question still remains as to what causes it.

#### NOTES ON THE PHYSICAL EXAMINATION

Dullness high at the lung bases probably because of a high diaphragm, and that because of abdominal distension.

There is probably some peritoneal fluid in addition to the obstruction.

Whether the mass was in the intestine or pressing against the intestine we can not say.

I do not believe the surgeon was much disappointed at the patient's refusal of operation. This is not the sort of case where anyone hankers to do an operation or thinks he is going to do much more than prolong misery.

#### DIFFERENTIAL DIAGNOSIS

There are three possibilities from the abdominal examination. Only very minute study could have distinguished these from each other, and with our record we cannot distinguish them at all: (1) intestinal obstruction, (2) acute peritonitis and (3) dropsical ascites. (1) She has been treated for a tumor which we believe is prone to malignant degeneration. It is quite possible therefore that she has malignant disease in some of the generative organs, and that might well metastasize or press so as to obstruct the large intestine. (2) The acuteness of the symptoms makes us think of peritonitis, which might be due to some leakage from the intestine such as often occurs in chronic obstruction. (3) Malignant disease, which I suspect as the basis of this condition, often so blocks the vessels of the abdomen as to give us ascites. She has so much fluid that I should suppose some if not all of it was ascites.

There is not much to support the idea of general peritonitis. It seems to me more like a cancerous mass with ascites and obstruction, but without peritonitis. At the same time I do not know how to exclude peritonitis, although there is not enough evidence to make it clear.

If we say neoplasm with intestinal obstruction

probably from outside the intestine, and ascites due to blocking of the circulation, where shall we put the malignant disease? In the pelvis obviously, but where in the pelvis? In the uterus or adnexa, the uterus a little more probably, but with metastasis in all probability outside, so that it is not of very great importance where it started. But my guess is that it started in the uterus.

A PHYSICIAN: How about her kidneys?

DR. CABOT: All we have here to make us think of nephritis is a large trace of albumin. Either of the conditions we have suggested, either intestinal obstruction or peritonitis, is capable in itself of producing that albumin. I should say that with no more history or symptoms of nephritis we would better say she has not got it.

What is the most likely kind of malignancy? Carcinoma I think.

A PHYSICIAN: How common is malignancy on a fibroid basis?

DR. CABOT: My surgical friends tell me that it is not at all uncommon, and they are always afraid to leave a fibroid tumor long without operation because they have seen so many of them undergo that change which we call degeneration into malignancy.

The reason I do not think she has a cancer in the intestine itself is because there is nothing in the record to suggest it. I think it is probably therefore from outside. I think she may have general peritonitis, but I am not at all sure.

CLINICAL DIAGNOSIS (FROM HOSPITAL RECORD)

Carcinoma of the ovary.
Partial intestinal obstruction.

DR. RICHARD C. CABOT'S DIAGNOSIS

Carcinoma of the uterus with metastases.
Intestinal obstruction.
General peritonitis?

ANATOMICAL DIAGNOSIS

1. *Primary fatal lesion*

Malignant lymphoma of mesenteries, omentum, intestines, right kidney, retroperitoneal and bronchial lymph glands.

2. *Secondary or terminal lesions*

Ascites.
Edema of lungs.

3. *Historical landmarks*

Slight chronic pleuritis.

DR. RICHARDSON: Scattered over the skin were smaller and larger dirty crusty areas and streaks, the condition mentioned clinically. There was some distension of the abdomen; no definite rigidity of the wall.

The peritoneal cavity contained about 3500 c.c. of pale slightly opalescent fluid. The great omentum was greatly thickened, and the peritoneum over it was thickened and granular. The section surfaces showed smaller and larger nodules of homogeneous pale new-growth-like tissue, lymphomatous in character. The mesentery was generally greatly thickened, to ten cm., and the peritoneum over it was thickened and somewhat granular. Within the mesentery were smaller and larger gland-like masses showing section surfaces similar to those already mentioned. The retroperitoneal glands were enlarged and showed similar section surfaces. The small intestine over its greater length was negative; but in three places, one of which was about five cm. long, the rugae were thickened, smooth and whitish. On cross section there was thickening of the wall. The section surfaces were infiltrated with pale homogeneous new-growth-like tissue. The picture grossly was one of malignant lymphoma. The large intestine was negative.

In the region of the lower left quadrant the thickened mesentery and coils of intestine formed a large irregular mass 20 cm. by 12 cm. in the other dimensions. This was the mass spoken of in the clinical record.

The margin of the liver was two cm. above the costal border. The diaphragm on the right was at the fourth rib, on the left at the fourth interspace.

The bronchial glands were slightly to moderately enlarged. In places the section surfaces showed areas similar to those described in the glands below the diaphragm. The lungs showed some edema.

The liver weighed 1886 grams. The tissue was punky and pale. The spleen weighed 102 grams; rather small, otherwise negative. The kidneys weighed 280 grams. The cortex measured five to six mm. The tissue generally was negative. But on the surface of the right kidney there were two small whitish gray nodules a few mm. across. The uterus and adnexa were negative.

The head was not examined.

DR. CABOT: Have you any impressions of the frequency of the change from fibroid to malignancy in the uterus?

DR. RICHARDSON: The condition you mention, if one accepts it, occurs once in a while, but I do not think it is very common.

DR. CABOT: Here presumably he thought he had fibroid, but it was lymphoma, controlled for a time by X-ray, then going ahead.

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## CASE 10332

An Italian-American boy of eight entered February 19.

F. H. His mother's third pregnancy terminated in a miscarriage. Five other children were living and well. One grandfather had "rheumatism."

P. H. The patient was normally delivered at full term and weighed nine pounds at birth. He was breast fed for thirteen months, and developed normally. At two years he had measles, at three years pneumonia, at four chickenpox, at five mumps, and at six whooping cough. He was considered a healthy child until the present illness. Since the age of three he had had attacks of recurrent tonsillitis about once a year, usually during the winter months. Two years ago his mother was advised to have his tonsils removed.

P. I. In January his mother's attention was called by the school nurse to the fact that the boy was very "nervous" in school, that he was very restless and could not write so well as formerly. His mother paid no attention to this. Three weeks before admission she took him to a physician because of loss of appetite. As there was at that time no vacancy in this hospital he was put to bed at home. He got very little rest, however, as the home environment was not suitable for rest. The mother then noticed that he constantly tossed about, held his hands and legs in awkward positions, and had considerable twitching of the facial muscles. During sleep all these movements disappeared. During the past two weeks his appetite had improved and his bowels had been regular.

P. E. A well nourished boy looking very well. Some evidence of mild involuntary motions of the extremities and face. Throat injected. Tonsils greatly hypertrophied and injected. Cervical glands slightly enlarged. *Lungs* normal. *Heart* not enlarged. Slight sinus arrhythmia. Sounds of good quality. A soft blowing systolic murmur at the apex, slightly transmitted outward. An inconstant third sound at the apex. Pulses and *abdomen* normal. *Extremities.* Slight incoördination of motions in hands and feet, with some involuntary twitchings. There was some involvement of the head and face muscles. *Pupils* and *reflexes* normal.

*T.* 98°-101°. *P.* 60-127. *R.* 19-33. *Urine.* Amount not recorded, sp. gr. 1.017-1.035, no albumin or sugar, sediment negative. *Blood.* Hgb. 75%, leucocytes 6,600-9,200, polynuclears 62%, reds 5,344,000, slight achromia, otherwise normal, platelets slightly decreased. *Wassermann, Pirquet* and *Schick* tests negative. *Stools.* No abnormalities recorded. *X-ray.* Both lung fields normal throughout. Hilus shadows distinctly increased. A few dense calcified glands in this region.

*Orders.* February 20. Sodium salicylate gr. xx with sodium bicarbonate gr. xx t.i.d. Force fluids. February 23. Hot baths. February 26. Thyroid gr. i once a day. March 10. Aspirin gr. x every four hours.

The child had enuresis. By February 22 the involuntary movements were more marked. At a limited area just inside the apex Dr. White found a short mitral diastolic rumble. The boy grew progressively worse. After February 24 the diastolic murmur was not heard. March 5 there was a third heart sound. March 9, nearly two weeks after the thyroid extract was begun, he seemed slightly worse. He was now on salicylate therapy and hydrotherapy. The twitching movements became somewhat improved. Other improvement, however, was slower. March 21 the heart showed a middiastolic murmur. The general condition improved. March 25 the involuntary movements were distinctly less than four days earlier.

March 17 it seemed that on the whole the condition had not improved much after the best possible care. The tonsils were much protruded, ragged and reddened. The cervical glands at the angles of the jaw were palpable.

March 27 tonsillectomy and adenoidectomy were done. By the thirty-first the chart was normal, the involuntary movements were less marked, the heart sounds were of fair quality, $P_2$ accentuated. A shortened diastolic murmur was localized at the apex, with a soft blowing systolic. The boy gradually improved. The twitching became much less. March 22 he was discharged to a children's institution, where the same treatment was to be followed, i. e., salicylate therapy, hydrotherapy, and four to six weeks of rest in bed.

## Discussion

BY DR. FRITZ B. TALBOT

This case is a characteristic example of chorea. It is to be noted that the child became progressively worse for about six weeks, and that after this he improved gradually until he was discharged from the hospital. Up to the present time no specific treatment for chorea has been found. Most patients become progressively worse for six or seven weeks and then steadily gain. If the patient is seen towards the end of the disease one might think that the treatment given had caused improvement, whereas the improvement was bound to come under any circumstances. It is due to this that so many claims have been made for various kinds of treatment in chorea.

Since chorea is part of the rheumatic and endocarditis syndromes it would seem that it must be connected with an infection. For this reason it is the policy of most clinics to remove all sources of infection when possible. In this case the tonsils were obviously infected. They were consequently removed as soon as it seemed wise to do so. The improvement that followed, however, can not be attributed to the removal of the tonsils alone, because it came after the height of the disease had been reached and the child had commenced to improve. It has been suggested that carious teeth that are not draining may also be a source of infection. Consequently all carious

teeth in children with chorea should be cleaned, removing all visible source of infection.

During the past fifteen years or so various methods of medical treatment have been tried without apparently affecting the course of the disease. Fowler's solution has been given in increasing doses up to the point of toxicity, and salicylates have also been given in large amounts, both without apparently affecting the course of the disease. Phenacetin and other drugs recommended have also been tried in this clinic, and the conclusion has been reached that the child does just as well without them.

Although very little can be accomplished by drugs a great deal can be accomplished by nursing. The child should be kept sufficiently isolated to be free from mental stimulation. Warm baths may be given once or twice a day for their quieting influence. He should be kept in a sunny room and should be given the benefit of the tonic effect of sunshine, fresh air, and food. The bowels should be kept open so that there is one satisfactory movement daily. He should receive at least three pints of liquid during the day. He should have enough amusements to keep him happy, and during the stage of improvement should have carefully supervised training in controlling his movements. All this should be done in bed.

Patients who have had chorea may have a second attack, although this is not very common. Many cases recover from the attack without any cardiac involvements, but Dr. Paul White has found in this clinic that a considerable proportion of the children develop signs of a mitral stenosis within five years after an attack of chorea. The disease chorea in itself rarely becomes serious enough to cause worry about the outcome. In an occasional case it is necessary to give enough bromide to quiet the child so that he will not wear himself out with the involuntary movements. The heart, however, should be carefully watched in order to recognize and treat endocarditis if it appears, for if untreated this complication is usually more serious than the chorea itself.

CLINICAL DIAGNOSIS

Huntington's chorea.
Rheumatic heart.
Hypertrophied tonsils. Adenoids.

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## CASE 10333

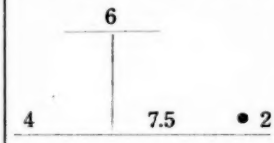
*First entry.* An Irish housewife of fifty entered November 26 complaining of vomiting and a mass in the right upper quadrant.

F.H. Good.

P. H. She had had measles and some other childhood diseases. Her eighth, tenth and eleventh pregnancies had ended in miscarriages. Eight children were living and well. At thirty-nine she had pneumonia. For a year after this her lungs were weak. For seventeen years she had had varicose veins and her ankles had swelled occasionally after long standing. She had occasional palpitation. For years her bowels had been moderately constipated. Before the present illness she had rare headaches; since the onset she had had none. She formerly urinated at night, not at present. Her menstruation had been regular until the last period, two months ago. Her best weight was 193 pounds, four months ago. Her weight at the hospital was 117.

P. I. Fourteen weeks ago she was severely burned from the explosion of a stove, setting fire to her clothes. She spent two weeks in one hospital and five weeks in another. Since the day after the accident she had vomited almost daily. The vomitus was usually green and contained only the food eaten just previously. She had had much nausea and had therefore eaten little and had lost much of that. She felt very weak. For the past seven weeks she had been in bed most of the time because of weakness. Her bowels had been more than usually constipated. The vomiting had no relation to meals and was not affected by the kind of food eaten. She vomited three times the day before admission and twice the day of admission. The nausea was somewhat worse when she sat up.

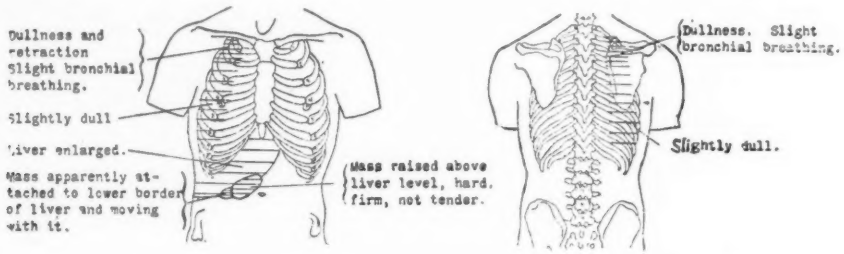
P. E. Fairly well nourished. Skin dry. Scars of burns over chest, abdomen and inside of both arms. Teeth poor. Carious roots. Marked pyorrhea. Chest expansion greater on the left. *Lung* signs as shown in the diagram. Spine very stiff. *Heart.* Apex impulse not found. Percussion measurements as shown in the figure. $A_2$ slightly accentuated. No murmurs or thrills. Pulses fair volume and tension. Artery walls palpable. *B. P.* 110/65-120/80. *Abdomen* tympanitic except in the right upper quadrant. Liver dullness from the fifth rib to a hand's breadth below the costal margin, where the edge was felt. Mass as shown in the diagram. *Genitals* negative. *Extremities* negative except for discoloration of the shins from varicose veins. *Pupils* and *reflexes* normal. *Rectal examination* negative. *Pelvic examination.* Slight yellowish discharge. Cervix torn posteriorly, hardened.




Before operation *T.* 98°-101°, *P.* 65-123, *R.* 18-24; *urine,* normal amount, sp. gr. 1.018-1.014, cloudy at one of three examinations, the slightest possible trace to a very slight trace of albumin at three, none at the fourth, a catheter specimen, which showed ten to twenty red blood corpuscles per high power field; *renal function,* November 27 40% (off color—bile?), December 2 30%? (color not conclusive), December 8 30%-35%; *blood,* hgb. 75%, leucocytes 20,600-

6,800, polynuclears 77%. *Wassermann* negative. *Gastric analysis. Fasting contents.* 40 c.c. of yellow material. No free HCl. Total acid 11. Guaiac negative. *Test meal.* 110 c.c., slightly brown. Free HCl 12, total acid 32. *X-ray.* In the lower portion of the gall-bladder region was a large irregular shadow, probably due to dense material in the bowel. Plate of the chest showed an unusually high right diaphragm, clean outline. Some thickening of the glands at the lung roots with clouding and beading along the peribronchial markings, which extended well towards the periphery and to or above the level of the first rib. It was rather diffuse, although somewhat more pronounced in the upper lobe. . . . . The stomach contained all of the meal at six hours. Peristalsis was very sluggish. At long intervals a deep wave passed symmetrically along both curvatures. No definite irregularity or filling defect was made out, although there was a suggestion of slight irregularity at the pylorus. Nothing left the stomach during the examination. Duodenum not seen. At twenty-four hours the stomach and duodenum were empty. The cecum and ascending colon contained all the barium visible and the column terminated quite abruptly at the hepatic flexure. . . . "Recommend examination of the colon by barium enema after careful cleaning out." December 6. Large bowel still apparently full of barium from transverse colon to rectum. No enema. . . . December 30. No definite evidence of gall-stones.

The patient vomited very little, only twice from December 1 to 7. December 9 operation was done.


Dullness and retraction Slight bronchial breathing.
Slightly dull
Liver enlarged.
Mass apparently attached to lower border of liver and moving with it.
Mass raised above liver level, hard, firm, not tender.
Dullness. Slight bronchial breathing.
Slightly dull.

## Discussion

### by dr. edward l. young, jr.

This story starts so abruptly with the burn that we have to assume the present condition is either more or less directly connected with it or that whatever it is had caused no symptoms of importance before and has gained very rapidly since. The vomiting coming on immediately after the burn can be due, of course, to the toxemia from the burn itself. We know that at times the poisoning results in duodenal ulcers, and the continued vomiting makes us wonder if that is the case here.

Her loss of weight of seventy-six pounds, presumably all in fourteen weeks, either means a very high grade of starvation from almost complete pyloric obstruction, or else a malignancy which has developed very rapidly since her accident.

The examination up to the X-ray does not help us very much. The one thing of importance is the mass which is described as in the diagram. It is more suggestive of malignant disease than of an inflammatory mass. If it were due to inflammation connected with this accident, such as a subacute perforation of an ulcer, it should show tenderness at this stage. Moreover, we should expect her to have more evidence of sepsis than she shows in her chart. X-ray shows a very high degree of pyloric obstruction, but it does not help us any more in regard to malignant disease.

The last note made here, that the patient vomited very little, suggests very strongly that part of the obstruction is due to spasm and that rest and non-irritating food relieved part of that spasm.

Of course at her age gall-stones are not uncommon, and it may be that they are at the bottom of the whole trouble; the fact that part at least of the pyloric obstruction is spasm would point to this diagnosis more than to ulcer. It does seem rather hard to believe that malignant disease has advanced as this has, or could have been as rapidly progressive as it must have been to cause this picture. It is strongly suggestive, it seems to me, of an inflammatory background in spite of the argument against it. I do not see how it is possible to make an absolute diagnosis. On the theory of chances alone I should put malignant disease first, inflammatory disease second, the inflammation starting either in the gall-bladder or as a subacute perforation of an ulcer.

### X-ray interpretation

The chest picture suggests lymphatic infiltration which may be tuberculous. . . Findings in the stomach suggest an obstructive lesion at the pylorus, but the appearance of the colon suggests that there may be pathology there to which the pyloric obstruction may be secondary.

### dr. young's pre-operative diagnosis

Carcinoma of the stomach?
Acute cholecystitis?
Perforated duodenal ulcer (subacute).

PRE-OPERATIVE DIAGNOSIS

Duodenal ulcer?
Malignancy?

OPERATION, FIRST ENTRY

Gas and ether. Six-inch right rectus incision. On opening the abdomen a matted mass of omentum was found. On exploring this a ruptured gall-bladder with several bean-sized stones was found. Drainage, 1 rubber tube and a cigarette wick.

PATHOLOGICAL REPORT

Six pale yellow spherical calculi the size of cherry pits.

Cholelithiasis.

HISTORY CONTINUED

The patient did fairly well after operation. She vomited the next day, but by December 12 was not vomiting. The wound drained only a small amount of bile. December 16 she was draining an ounce and a half of bile and a small amount of pus. By the 19th the drainage was mostly purulent. The wound was still pretty moist. December 21 the tube was taken out and the following day the wick. The drainage was greatly decreased. The wound was cleaning up slowly. By December 26 she was in good condition. The wound was closing rapidly. There was a small dry granulating area. December 27 she was discharged.

FURTHER DISCUSSION

Apparently the minds of the attendant surgeons worked somewhat as mine did, in that they put ulcer first and malignancy second. But I think I scored by putting in gall-bladder disease as a strong possibility. It is hard to see how we can connect this condition with the burn. It seems to me it is one of the strange coincidences which we occasionally meet with. The story sounds as though she did just as she should have done, the proper treatment was given, and eighteen days after operation she was discharged relieved.

HISTORY CONTINUED

*History of an interval of a year.* On leaving the hospital she was weak. She gradually regained strength and had no more gastric trouble until six months later. Then she had an attack of sharp epigastric pain radiating to the back, lasting two days, not relieved by hot water, soda or soda mint. There was some eructation of gas. Two months later she had a similar attack. Then she had no more trouble until four weeks before readmission, when the pain returned in the epigastrium and the right upper quadrant, radiating to the back, and accompanied by distension. Her bowels were very constipated. She had taken cascara and salts with slight relief. The day before readmission she had a small movement, very dark. The pain had been present off and on, varying in severity, relieved by vomiting, lasting half an hour to days. Between the attacks she felt fairly well. Five days before readmission she vomited for the first time. Two days later and again two days after that she induced vomiting by putting her finger down her throat. There was a possibility of slight jaundice. Two hours after a meal she had epigastric discomfort with considerable gas. The urine was dark colored. Until the past four weeks she had always urinated once at night. For four weeks this had not happened. Her last cta. was three weeks before readmission. For three months before that she had had none.

*Second entry,* January 5.

P. E. (As before except as noted.) Well nourished. Left *lung* resonant throughout. Vocal and tactile fremitus normal. Right lung, slight dullness and increased whispered voice at the right apex in back, slight dullness at the apex in front. *Abdomen.* No masses. Very slight tenderness in the region of the scar of the former operation in the right upper quadrant. Scar not tender. Liver not felt.

Before operation *chart* normal, amount of *urine* not recorded, cloudy, sp. gr. 1.028, bile present, rare hyalin casts, bile stained rare red blood corpuscles, 2-4 leucocytes per high power field; *blood* not recorded.

January 8 operation was done. The patient was returned to the ward at twelve o'clock and was out of ether at twenty minutes of two. The pulse was rapid, with fair volume and tension. She was put up on shock blocks and given a subpectoral. At four o'clock her condition seemed to be improved. Soon afterward, however, she became restless. Her breathing was embarrassed. The pulse grew steadily more rapid and weak. The picture was that of surgical shock and internal hemorrhage. At quarter to six she died.

FURTHER DISCUSSION

The story after she leaves the hospital points to the fact that they got the trouble and apparently all of the trouble until six months after operation, when she had an attack of pain which suggested gall-stone colic. The complete remission of pain between the attacks, the type of the attacks, and the suggestion of jaundice, all point toward trouble in the biliary tract. As we have seen in these exercises several times, it is a very difficult matter always to feel and remove all the stones in the biliary tract, as it is very easy for a small stone to get into the hepatic ducts of the liver and make trouble later. The story suggests that something of this sort has happened, and in view of the difficulties encountered at the first operation this would seem all the more possible. I do not see how we can make a diagnosis of ulcer on the story.

DR. YOUNG'S PRE-OPERATIVE DIAGNOSIS

Stone in the common duct.

PRE-OPERATIVE DIAGNOSIS

Stone in the common duct.

OPERATION, SECOND ENTRY

Gas and ether. The old scar was excised. A mass of adhesions was found to the liver, the stomach and the transverse colon. The pylorus and duodenum were three to four inches to the right of the normal position. They were dissected free into normal position. The common duct was still to the left of the duodenal attachment. The duodenum could not be dissected further. A stone the size of a filbert was felt without difficulty inside the duodenal loop through the head of the pancreas, about two inches from the papilla. The stone was removed by dissection through the head of the pancreas into the common duct. There was moderate hemorrhage from the pancreatic tissue. The wound in the pancreas was packed with gauze. One cigarette wick to the kidney pelvis.

PATHOLOGICAL REPORT

A spherical stone the size of a cherry-pit with an area of skin containing a scar.

Choelithiasis

FURTHER DISCUSSION

It must have been a very difficult operation, and it seems to me the surgeon did well to get the stone with as little trouble as he did. The picture that we get on paper is what they call surgical shock and hemorrhage. We have to leave it to Dr. Richardson to tell us the exact conditions present.

CLINICAL DIAGNOSIS (FROM HOSPITAL RECORD)

Obstructing common bile duct.
Surgical shock.
Post-operative hemorrhage.
Operation, exploratory laparotomy for obstruction of common bile duct.

DR. EDWARD L. YOUNG'S DIAGNOSIS

Stone in common duct.
Hemorrhage.
Surgical shock.

ANATOMICAL DIAGNOSIS

1. *Primary fatal lesion*

(Pancreatic stone.)

2. *Secondary or terminal lesions*

Operation wound.
Hemorrhage into the pancreatic tissue, the peritoneum, retroperitoneal tissues and peritoneal cavity.
Anemia.
Dilatation of the bile ducts.

3. *Historical landmarks*

Chronic pleuritis.
Obsolete tuberculosis of the apex of the right lung.

DR. RICHARDSON: The skin generally was a little sallow, but showed no definite icterus. On the right side of the thorax, anterior wall, and in the region of the breast there were old scar-like areas, and there were small similar areas on the inner aspect of the left upper extremity. These scar-like areas resembled those of burns. There were some slight varicosities of the veins of the legs. In the margins of the operation wound and about the cigarette wick there were small masses of blood clot.

The peritoneal cavity contained at least 1000 c.c. of blood and blood clot. The peritoneum and the retroperitoneal tissues were infiltrated over large areas with blood-like material. The large intestine contained only a small amount of yellowish brown fecal material.

The anterior margin of the liver was at the costal border. The diaphragm was at the fourth interspace on the right, fifth interspace on the left. The right lung was bound down by old adhesions. There were a few adhesions between the lower lobe and the diaphragm on the left.

The lung tissue generally was pale, spongy, and yielded a small amount of thin reddish frothy fluid. The peripheral portions of the upper lobes showed a moderate amount of emphysema. The apex of the right lung presented a small fibrous pigmented mass with calcareous particles scattered through it. It rested just beneath the pleural adhesions.

The aorta and great branches showed only a slight amount of fibrous sclerosis.

The tissue of the liver was flabby, pale brown-red, with a very slight greenish cast. The gall-bladder was not found. There was a small portion of the cystic duct present which ended blindly in the region of its upper end. Its mucosa was negative. The hepatic duct and its great radicles in the liver were markedly dilated. The hepatic measured 16 mm. in circumference. The mucosa was negative. The common duct was markedly dilated, 22 mm. in circumference. This dwindled down until in the region of the lower end of the duct it was about the usual circumference. In the region of the ampulla of Vater it was about 12 mm. in circumference. Just above the ampulla the posterior wall of the duct presented a ragged margined opening postero-laterally to the left. This opening communicated with the pancreas along a ragged tract lined with blood clot. This tract in turn was continuous with a small excavation in the region of the head of the pancreas. The inner surface of the walls of the cavity were irregular, rough, rather ragged and lined with blood clot. The duct of Wirsung away from the cavity was frankly negative. A pancreatic stone

was said to have been removed from this cavity at the operation. The pancreatic tissue elsewhere was negative except that in the region of the head the tissue showed some infiltration with blood clot, and blood and blood clot extended along its outer surface and into the pancreatic tissues. In the region of the excavation in the head of the pancreas there were many sutures.

The tissue of the spleen was a little soft.

The head was not examined.

## CURRENT LITERATURE

### ABSTRACTORS

GERARDO M. BALBONI
WILLIAM B. BREED
LAURENCE D. CHAPIN
AUSTIN W. CHEEVER
RANDALL CLIFFORD
ERNEST M. DALAND
HORACE GRAY
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JOHN B. SWIFT, JR.
GEORGE G. SMITH
W. T. SHERMAN THORNDIKE
WILDER TILESTON
HENRY R. VIETS
BRYANT D. WETHERELL

### GRANULOMA INGUINALE

SCHOCHET, S. S. (*Surgery, Gynecology and Obstetrics*, June, 1924).

This author reports a case observed in Chicago and gives the definition, history and geographical distribution, etiology, pathology, differential diagnosis, complications, prophylaxis, and treatment, and draws conclusions as follows:

1. Granuloma inguinale is becoming more common in the United States, and is, no doubt, masquerading under various diagnoses.
2. A careful study of all ulcerations about the genitals should be made for Donovan bodies, especially in those cases in which syphilis and tuberculosis have been eliminated.
3. Granuloma inguinale is never associated per se with general adenopathy.
4. Granuloma inguinale should be placed on the list of reportable diseases.
5. Antimony compounds are specific for granuloma inguinale.

[E. H. R.]

### REPORT ON 262 CONSECUTIVE CASES OF APPENDICITIS

GATCH, W. D., and DURMAN, D. C. (*Annals of Surgery*, June, 1924).

These authors carefully analyze their cases and draw the following general conclusions:

1. Appendicitis is probably the most important and frequent surgical disease. About 14,000 people die annually from it in the United States.
2. A series of 262 consecutive cases of gangrenous appendicitis is reported. The death rate for the entire series was 7.2 per cent.; the same for 205 cases complicated by abscess was 9.2 per cent.
3. The pre-operative intravenous injection of normal saline solution is advocated as a treatment for all very sick patients.
4. The advantages of the McBurney incision are pointed out.
5. The expectant treatment of appendicitis is not advised.
6. Removal of the appendix by the technic described does not increase the risks of operation in most cases.
7. The post-operative treatment employed consisted in:
   (a) The administration of plenty of fluid, by the intravenous route, if water could not be taken by mouth.
   (b) Sufficient morphine.
   (c) Starvation until peritonitis had completely subsided.
   (d) No cathartics.
   (e) Free use of gastric lavage.
   (f) Frequent examination for secondary abscesses, and prompt drainage of the same.
8. Peritonitis accounted for 11 of the 19 deaths which occurred in the series. The chief causes of peritonitis were purgation and extreme virulence of the infection.
9. Certain virulent and rapidly fatal cases of appendicitis are complicated by a general septicemia.
10. Prompt diagnosis and early operation in appendicitis would decrease the mortality almost to the vanishing point.

[E. H. R.]

### LYMPHOID HYPERPLASIA OF THE APPENDIX IN CHILDREN AND ITS RELATION TO RECURRENT APPENDICITIS

SMITH, T. A. (*Annals of Surgery*, June, 1924).

This author calls attention to the condition often found by the pathologist on examination of appendices removed at operation which did not show gross pathological conditions. Microscopically, the appendix showed evidence of marked lymphoid activity, and the author believes that many cases of supposed appendicitis in children are due to this condition. The symptoms are often very similar to those of acute appendicitis, and the patient is generally entirely relieved by operation.

He believes that the sub-acute or chronic appendicitis, usually of the recurrent type, occurs in approximately 10 per cent. of children with appendiceal symptoms. In the great majority of cases the symptoms are not due to inflammation of the appendix but to excessive hyperplasia of the lymphoid tissues within its walls, which symptoms are promptly and permanently relieved by removal of the appendix. As a majority of these cases conform to a recognizable syndrome, lymphoid hyperplasia should be considered a clinical entity among diseases of the appendix.

[E. H. R.]

### VASCULAR ACTION OF DIGITALIS

GANTER, from Morawitz's medical clinic at Würzburg, reports (*Münch. med. Woch.*, April 18, 1924) his studies on the vascular action of diabetes. Strophanthin injections produce an improved superficial circulation. Therapeutic strophanthin doses, besides their effect on the heart, depress the vascular tissues and therefore produce a dilation of the arteries. Improvement of the circulation by strophanthin is to be explained only by a dilation of the arteries.

[R. M. G.]

### INTRA-INTESTINAL DEVELOPMENT OF OXYURIS

WENDT, from von Redwitz's surgical clinic at München, reports (*Münch. med. Woch.*, April 25, 1924) his observations on the possibility of intra-intestinal development of oxyuris. He finds that in 24 per cent. of all cases oxyuris or its eggs are in the operatively removed appendix.

[R. M. G.]

THE BOSTON
# Medical and Surgical Journal

*Established in 1828*

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SUBSCRIPTION TERMS: *$6.00 per year in advance, postage paid for the United States, $7.56 per year for all foreign countries belonging to the Postal Union.*

*Material for early publication should be received not later than noon on Saturday. Orders for reprints must be sent to the printer with galley proof of paper.*

*The Journal does not hold itself responsible for statements made by any contributor.*

*Communications should be addressed to The Boston Medical and Surgical Journal, 126 Massachusetts Ave., Boston, Mass.*

## A NEW RACE OF AMAZONS?

GRAVE concern is being felt, according to J. F. Rogers, writing on athletics for women for the Bureau of Education, lest harm should follow this breaking away from old traditions and customs. In England, also, the entry of women into athletics has been marked to such an extent that in 1921 a committee was formed to study the problem under the chairmanship of the pediatrician, Dr. Still, and consisting of representatives of the College of Physicians and Surgeons, the British Association for Physical Training, the Ling Association, the National Union of Women Teachers, and other educational organizations. As the result of a questionnaire sent out by this committee, approval was expressed for sports in general for women, excluding football, competitive rowing and the like; including tennis, net ball and lacrosse.

In our own country a group of 200 leaders in physical activities met in Washington in April, 1923, at the suggestion of the National Amateur Athletic Federation of America and under the chairmanship of Mrs. Herbert Hoover. As a result there was formed the Women's Division of the National Amateur Athletic Federation with Mrs. Hoover as its chairman. Important and sensible resolutions were drawn up at this meeting, embodying many wise suggestions. Athletics in general for women were endorsed with adequate supervision, with frequent physical examinations of those participating, and with instruction in hygiene and matters of health. The over-development of the competitive element was warned against, and to this end the awarding of prizes other than symbolic ones was decried. Supervised athletics for the many was the keynote of the resolution, rather than intensive training for the few.

Nature has decreed that men and women should function differently in the universe. There has unquestionably in the past been an over-emphasis of their differences—probably largely man-made. A great change has come about within a generation, tending, it may be, to destroy too utterly the differences of sex. In her struggle for equality, which was her right, the inclination of woman has been imitative, rather than independent. That woman should be legally equal to man, few would now deny; her indulgence in football, hair cuts and trousers is her subconscious effort to proclaim this equality. There is no question that a proper indulgence in athletics is good for women as it is for men. This does not necessarily imply, however, that she should select the same forms of exercise. Certain difference between the sex lines of human beings and wild animals must be recognized.

Those responsible for male athletics could well afford to take to heart the resolutions of Mrs. Hoover's committee. Instruction in hygiene; frequent and thorough physical examinations; the emphasis laid upon athletics for the many rather than for the highly trained few; some curbing of the intensely competitive spirit; all may apply to athletics in general as well as athletics for women. These have been the goals towards which the Department of Hygiene at Harvard has aimed during the past ten years, and in large part attained.

## TYPHOID IN THE LAP OF NATURE

ON July 19 the number of cases of typhoid fever traceable to Englewood Brook in the Palisades Interstate Park had reached seventy. Among the first to contract the disease were a number of Boy Scouts who had camped in the park and drank from the brook. So heavy is the infection of the brook that cultures have been made direct from its water. The New York City Health Department, according to the *Journal* of *the American Medical Association*, discovered the source of the outbreak and posted warnings, but acting under a recent law the state board of health has taken over supervision of health measures in the park north of the New Jersey line.

As the brook empties into the Hudson River, the dangers from bathing in the river have increased, and warnings to that effect have been issued by Health Commissioner Frank J. Monaghan of New York. Further cases occurring in

northern New Jersey have brought the total number attributable to this source to more than 100.

The task of guarding humanity against infectious diseases is a ceaseless one.

## CORRESPONDENCE

### DEPARTMENT OF PUBLIC HEALTH

State House, Boston, July 19, 1924.

*Editor, Boston Medical and Surgical Journal:*

Sir—In compliance with a resolve of the Legislature directing the Department of Public Health "to investigate the conditions existing throughout the Commonwealth with respect to the maintenance of adequate and competent health and medical service in sparsely settled districts," the Commissioner of Public Health, with the approval of the Public Health Council, appointed the undersigned as a departmental committee to make such an investigation.

This is a matter which has attracted attention and study for a number of years with increasing frequency, not only in this State and nation but in many other parts of the world. It is one phase of the fundamental rural problem for which various social, economic and political solutions have been sought. It is true in this part of the country that the flow of physicians from the rural to the urban communities has been more rapid than that of the population as a whole. How completely this has been compensated for, at least in this State, by the extension of the telephone, the automobile, good roads and other modern methods of communication is a question to be considered. These and many other factors make final judgment in this matter difficult.

We are approaching the collection of data on this problem by direct personal interviews with laymen and physicians in those communities where such inadequacy of medical service would seem to be the most likely. This has been supplemented in other communities by the mailed questionnaire. In addition we hope to utilize certain statistical data which, however crudely and directly, may shed some light on the problem.

With this explanation may we utilize your column to request any of your readers who have suggestions, or opinions, or facts on this very vital social-medical problem to send them to the Committee, Department of Public Health, State House, Boston?

Yours truly,

GEORGE H. BIGELOW, *Chairman.*
WARREN C. JEWETT,
SYLVESTER E. RYAN,
CHARLES W. MILLIKEN,
HAROLD E. MINER, *Recorder,*
For the State Department of Public Health.

## MISCELLANY

### MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH

DISEASES REPORTED WEEK ENDING AUGUST 2, 1924

| *Disease* | *No. of Cases* | *Disease* | *No. of Cases* |
|---|---|---|---|
| Anterior poliomyelitis | 3 | Dogbite | 4 |
| Chickenpox | 24 | Epidemic cerebrospinal meningitis | 2 |
| Diphtheria | 77 | German measles | 5 |
| Gonorrhea | 127 | Syphilis | 33 |
| Hookworm | 2 | Suppurative conjunctivitis | 12 |
| Influenza | 4 | Trachoma | 3 |
| Measles | 67 | Tuberculosis, pulmonary | 107 |
| Mumps | 33 | Tuberculosis, other forms | 10 |
| Ophthalmia | 21 | Typhoid fever | 9 |
| Pellagra | 3 | Whooping cough | 54 |
| Pneumonia, lobar | 19 | | |
| Scarlet fever | 68 | | |
| Septic sore throat | 7 | | |

### CONNECTICUT DEPARTMENT OF HEALTH

WEEKLY MORBIDITY REPORT—WEEK ENDING AUGUST 2, 1924

(Including all cases reported before 11 A. M., Monday, August 4, 1924)

*Diphtheria*

| | |
|---|---|
| Fairfield County | |
| Bridgeport | 2 |
| Shelton | 1 |
| Stratford | 1 |
| Hartford County | |
| Berlin | 1 |
| Hartford | 7 |
| Manchester | 1 |
| New Britain | 2 |
| New Haven County | |
| Ansonia | 1 |
| East Haven | 1 |
| New Haven | 1 |
| Waterbury | 1 |
| New London County | |
| Lebanon | 1 |
| Tolland County | |
| Ellington | 1 |
| State total | 21 |
| Last week | 28 |

The following diphtheria bacilli carriers were reported:

| | |
|---|---|
| New Haven | 3 |

*Scarlet Fever*

| | |
|---|---|
| Fairfield County | |
| Greenwich | 1 |
| Hartford County | |
| Bristol | 1 |
| Canton | 1 |
| Hartford | 3 |
| New Britain | 2 |
| Litchfield County | |
| Thomaston | 1 |
| Middlesex County | |
| Chester | 1 |
| New Haven County | |
| Hamden | 2 |
| New Haven | 3 |
| Waterbury | 2 |
| New London County | |
| Stonington | 1 |
| Windham County | |
| Woodstock | 1 |
| State total | 19 |
| Last week | 23 |

*Typhoid Fever*

| | |
|---|---|
| Fairfield County | |
| Bridgeport | 1 |
| Stamford (T) | 2 |
| Hartford County | |
| Harftford | 1 |
| New Britain | 1 |
| New Haven County | |
| New Haven | 2 |
| Waterbury | 1 |
| State total | 8 |
| Last week | 10 |

*Measles*

| | |
|---|---|
| Hartford County | |
| Canton | 1 |
| East Hartford | 1 |
| Hartford | 6 |
| West Hartford | 2 |
| Middlesex County | |
| East Hampton | 1 |
| Old Saybrook | 1 |
| New Haven County | |
| Derby | 2 |
| Milford | 3 |
| New Haven | 7 |
| State total | 24 |
| Last week | 30 |

*Whooping Cough*

| | |
|---|---|
| Fairfield County | |
| Bridgeport | 1 |
| Greenwich | 2 |
| Norwalk | 2 |
| Stratford | 1 |
| Hartford County | |
| Canton | 2 |
| Hartford | 2 |
| Southington | 1 |
| Litchfield County | |
| Norfolk | 2 |
| Watertown | 6 |
| Middlesex County | |
| East Haddam | 2 |
| East Hampton | 1 |
| New Haven County | |
| Madison | 1 |
| Meriden (C) | 7 |
| New Haven | 6 |
| Waterbury | 1 |
| New London County | |
| Colchester | 1 |
| Lebanon | 1 |
| Stonington | 2 |
| State total | 41 |
| Last week | 65 |

No cases of smallpox reported this week.

| *Other Communicable Diseases* | |
|---|---|
| Cerebrospinal men. | 2 |
| Chickenpox | 16 |
| Dysentery (bac.) | 3 |
| Encephalitis epid. | 1 |
| Influenza | 2 |
| Malaria | 5 |
| Mumps | 18 |
| Pneumonia (lobar) | 4 |
| Poliomyelitis | 6 |
| Trachoma | 1 |
| Tuberculosis (pul.) | 33 |
| " (other forms) | 6 |
| Gonorrhea | 33 |
| Syphilis | 25 |

**The bulletins distributed by the Department with this report give information relating to the fly menace, cancer cure fakes and improved laboratory service.**

## JOINT COMMITTEE ON STATE AND NATIONAL LEGISLATION

At a recent meeting of the Joint Committee on State and National Legislation, it was voted, "That the Governor should be permitted to select the members of the Board of Registration in Medicine, from the medical profession, without present restrictions." It was also voted, "That the Mass. Med. Society and the Mass. Homeopathic Med. Society are in favor of one standard for qualification of fitness to practice medicine in this Commonwealth, and that the standard be determined by the Board of Registration in Medicine, said standard not to be lower than it is at present."

The recess committee will hold its first meeting on Wednesday, August 13th, and on succeeding Wednesdays, until it has been completed. The chairman of the recess committee has been asked to assign a definite date for the hearing on the Chiropractic bills, and Sept. 17th has been suggested as a suitable one. The date will be decided on at the Aug. 13th meeting, and notice will appear in the Boston Medical and Surgical Journal.

## A MEDICAL CORPS IN THE U. S. VETERANS BUREAU

The creation of a Medical Corps within the U. S. Veterans Bureau, through an Act of Congress, was recommended to Director Frank T. Hines, today, by the Medical Council in session at the Veterans Bureau.

This step was taken because of a belief that a permanent qualified personnel is highly essential to the best operation of the Bureau. The formation of a Medical Corps would give security of position to the doctors and assurance of permanent personnel to the Bureau.

The doctors in attendance at the Council sessions declared it their belief that the officials of the Bureau could greatly improve the medical service through the establishment of post-graduate courses for the training of the personnel along the lines of their special duties. Such courses would be established in hospital management, rating, tuberculosis, neuro-psychiatry, x-ray, rhinology, and diagnosis.

The Committee recommended that the Government Hospitals at New Haven and Denver be re-established as schools for training of doctors in tuberculosis.

The immediate establishment of diagnostic beds, where the troublesome cases coming before the Bureau might be properly observed by the qualified and trained diagnosticians, was recommended. Such an arrangement would prove most valuable in cases where there was a difference of medical opinion as to the claimant's disability or doubt as to the exact diagnosis.

"We recommend the establishing of regional diagnostic groups, consisting of the best available Bureau and local medical personnel and utilizing so far as possible, as consultants, members of this Council," said the members.

The Council adopted a resolution recommending the creation of a unit under the direction of the Medical Director which would provide in permanent form a record of the new and valuable medical experiences resulting from the operation of such a large welfare organization as that of the Veterans Bureau.

The establishment of a follow-up service was urged. This would provide for visits by Bureau nurses and doctors to the homes of those claimants who had been discharged as needing no further hospitalization.

The names of Dr. Horatio Pollock, Albany, N. Y., expert in neuropsychiatry, and Dr. Lawrason Brown, Saranac Lake, N. Y., a tuberculosis specialist, were added to the membership of the Council.

The Medical Council was given a free reign at their first session by General Hines and told to criticize the medical service most frankly. At the end of its sessions, it declared Gen. Frank T. Hines an able, courageous and fair executive, who has the welfare of the Bureau at heart and intends that the medical service shall be placed upon an efficient basis.

Dr. Kennon Dunham acted as chairman of the Council and Dr. M. T. MacEachern as secretary. Dr. Ray L. Wilbur, of Stanford University, is the permanent chairman.

Permanent Committees of the Medical Council of the U. S. Veterans Bureau.

COMMITTEE ON HOSPITALS, DISPENSARIES, AND GENERAL MEDICAL WELFARE:

Louis H. Burlingham, St. Louis Barnes Hospital.

Winford H. Smith, Johns Hopkins Hospital, Baltimore, Md.

S. S. Goldwater, Mt. Sinai Hospital, 5th Ave. & 100th St., N. Y. City.

M. T. MacEachern, 40 E. Erie St., Chicago, Ill.

W. C. Rapplaye, New Haven Hospital, New Haven, Conn.

M. M. Davis, Jr., 17 W. 43d St., N. Y. City.

Louis I. Dublin, 1 Madison Ave., N. Y. City.

R. U. Patterson, *Chairman*, Surgeon General's Office, U. S. A., Washington, D. C.

COMMITTEE ON GENERAL MEDICAL AND SURGICAL DISABILITIES:

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George Morris Piersol, 1913 Spruce St., Phila., Pa.
L. F. Barker, Baltimore, Md.
R. L. Wilbur, Stanford University, Calif.
Geo. W. Crile, Euclid Ave at 93d St., Cleveland, Ohio.
Joel E. Goldthwait, *Chairman,* 272 Marlborough St., Boston, Mass.

COMMITTEE ON NEURO-PSYCHIATRIC DISABILITIES:

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Sidney I. Schwab, Humboldt Bldg., St. Louis, Mo.
Thomas W. Salmon, 123 E. 53d St., N. Y. City.
C. Macfie Campbell, 74 Fenwood Road, Boston, Mass.
G. E. Myers, 518 March-Strong Bldg., Los Angeles, Calif.
G. M. Kline, Commonwealth Dept. Mental Dis., State House, Boston.
W. F. Lorenz, Mondota, Wisc.
Geo. H. Kirby, Psych. Institute, Wards Island, N. Y.
A. M. Barrett, Ann Arbor, Mich.
Douglas A. Thom, 520 Commonwealth Ave., Boston, Mass.
Horatio Pollock, Albany, N. Y.
D. J. McCarthy, *Chairman,* 2025 Walnut St., Phila., Pa.

COMMITTEE ON TUBERCULOSIS DISABILITIES

H. A. Pattison, 370 Seventh Ave., New York City.
Jas. Alexander Miller, 379 Park Ave., New York City.
W. L. Dunn, Asheville, N. C.
Kennon Dunham, Union Central Life Bldg., Cincinnati, Ohio.
F. C. Smith, Asst. Surgeon General, U. S. P. H. S., Wash., D. C.
Lawrason Brown, Saranac Lake, N. Y.
Roy Adams, *Chairman,* 204 Stonleigh Court Washington, D. C.

## SUMMARY OF STUDY ENTITLED "ADAPTING NUTRITION WORK TO A COMMUNITY"

THE New York Association for Improving the Condition of the Poor has issued a report prepared by Miss Lucy H. Gillett, Superintendent of its Nutrition Bureau, describing the methods employed, and summarizing the results of, an intensive campaign against malnutrition which the Association for Improving the Condition of the Poor has been carrying on in the Mulberry district of New York City. The report states that of 2,181 apparently well children examined in the medical clinics at Mulberry Health Center, 656, or 30 percent, were diagnosed as malnourished. Since much of the sickness and lowered vitality in later life is the result of poor nutrition, as physicians have frequently stated, the importance of providing educational guidance in nutrition as well as providing attention for the correction of physical defects is of tremendous importance.

If these children were in danger from fire or industrial accidents, the report states, every safety device and preventive measure known would be urged to protect them. Although the results from malnutrition are much slower, often much more indirect and much less dramatic than those from fire or accidents, they are even more deplorable because of the larger number affected and the lingering misery resulting.

Many a wage earner is unable to increase his income to the safety level because of health conditions due to poor nutrition. Too many children who apparently show no signs of disease or malnutrition are allowed to drift into the wage earning period with only a part of their rightful earning capacity developed. Thus handicapped there is danger that they may add to the responsibility of the health and social agencies.

Miss Gillett's report states that before any method for combatting malnutrition can be decided upon, it is first necessary to determine—(1) what nutrition work is being done and what other nutrition work should be done in the district; (2) what is the prevailing nationality, and what is their social and educational background; (3) are preventive or curative aspects of nutrition to be emphasized, or both; (4) shall the work be conducted in the interest of the preschool child, the school child, the adult, or for everyone in the community; and (5) what method shall be used.

The problem may be approached through small groups, through intensive work in individual families, or through general educational work with large groups, or a combination of any two or all three. The small group may be used with school children or intelligent mothers of pre-school children. It is useful in either a curative or preventive program. There are arguments for and against nutrition work exclusively in groups.

The following arguments for the group method are advanced: (1) One small group frequently arouses the interest of a whole neighborhood by providing a graphic illustration; (2) A large number may be reached in a short time; (3) The class spirit often gives a child courage to venture on new habits; (4) Because coöperation is frequently secured more quickly, the class sometimes reduces the number of home visits required.

Arguments against the group method are: (1) Home conditions cannot be as completely corrected—the work is not as thorough; (2) The

class spirit which prompts some good habit formation is removed when the class is over and children are apt to return to old habits; (3) Too many children are living under conditions which they are powerless to correct and about which the parents are indifferent; (4) In such cases home visits are necessary. Home visits in addition to the class period and preparation for it often takes more time than home visits alone; (5) The pre-school child himself can be taught comparatively little in groups. The intensive work in the home could often be done in the time it takes to get mothers to come to class; (6) Each worker has to decide for herself whether her conditions are favorable for group work; (7) Intensive work is always a necessary part of the curative program in cases where individual problems exist or where the coöperation of the parents is difficult to obtain; (8) General educational work may be used most effectively as a preventive measure, though doubtless much malnutrition may be cured thereby too.

During the four and one-half years of intensive work covered in the A. I. C. P.'s report, intensive care was given to 1,018 malnutrition cases and in addition the habits of all the boys and girls in the families of these special malnutrition cases were influenced. With an average of 3.8 children per family, 2,578 children received attention. There is much evidence that the work spreads to other families in the neighborhood, but such results are hard to estimate. We frequently hear of mothers who give milk and cereals to their children because children under our care were advised to use these foods.

Group work would naturally seem more economical of time than intensive home visits, but it was extremely difficult to get these women (who were mostly Italians) out at stated intervals and much time was lost thereby. The average cost per visit in a home has been estimated to be 37 cents. The average cost per person per lesson where the women were taught in groups was estimated to be 36 cents, with an average attendance of 8 per lesson. With practically the same cost per individual and with mose satisfactory results from intensive work, in this particular neighborhod the malnourished preschool child was handled more economically through intensive work than in groups. School children can doubtless be handled more economically in large numbers.

The report describes the methods employed and the results obtained through nutrition classes in schools, little mothers' clubs, poster clubs, mothers' groups, and nutrition classes in the schools.

## TAX ASSESSMENTS

THE new procedure that will be followed in connection with additional income tax assessments now that the Board of Tax Appeals has begun to function, was explained recently by Mr. M. L. Seidman, tax expert of Seidman & Seidman, Certified Public Accountants, upon his return from Washington, D. C., where the rules have just been formulated.

"Every taxpayer," Mr. Seidman said, "will now have an opportunity of having his case heard by the Board of Tax Appeals, before the Income Tax Department can assess or collect an additional tax. Furthermore, the right to this hearing is retroactively effective to all assessments proposed since June 2, 1924, the day the new law was passed, and applies even though the additional assessment is determined under prior income tax laws.

"Under the new procedure, whenever a deficiency appears to exist, the taxpayer will be notified by a letter to that effect, by the Commissioner of Internal Revenue, and he will be given thirty days within which to present a protest against the proposed assessment. An opportunity will also be afforded the taxpayer to hold conference with the Income Tax Unit in Washington, upon a request therefor being made.

"If, pursuant to the conference, or without conference, the Income Tax Unit and the taxpayer reach an agreement with respect to the amount of the deficiency, such amount will be forthwith assessed. Or, if the Unit concedes that no additional tax is due, the taxpayer will be notified to that effect. If, on the other hand, the Income Tax Unit and the taxpayer are unable to reach an agreement with respect to the amount of the deficiency, the taxpayer will be notified that the case has been transmitted by the Income Tax Unit to the Solicitor of Internal Revenue, for his consideration. The taxpayer will also have an opportunity of a hearing before the Solicitor, if request is made within twenty days after the case is so transmitted. The Solicitor will then submit his recommendations to the Commissioner, and the taxpayer will be notified by registered mail of the Commissioner's final determination.

"Within sixty days after the mailing of this registered letter the taxpayer may file an appeal with the Board of Tax Appeals. Such an appeal will stay all further action on the part of the Commissioner in proceeding with the assessment, except where the Commissioner believes that the assessment or collection of the deficiency will be jeopardized by any delay. Under those circumstances, the law permits the assessments to be made immediately, although the taxpayer still has the right to file a claim in abatement with a bond to stay the collection of the amount assessed, pending the final disposition of the claim.

"In any event, an opportunity for a hearing to both Government and taxpayer will be granted before the Board of Tax Appeals, and a decision will be made as quickly as possible. These hearings will be open to the public, and

where the amount of tax involved is $10,000 or more, written record will be made of the testimony in the case. The Board will function somewhat like a judicial body, although it is, in fact, an independent agency of the executive branch of the Government. Its decision will be communicated to both the taxpayer and the Government and will be binding on them. The only remedy that either side will then have will be to the courts. In other words, if the decision is in favor of the taxpayer, the Government will not be able to proceed with the assessment except through court action against the taxpayer; and if the decision goes the other way, the taxpayer will have to submit to the assessment and pay the additional tax. His only recourse will then be to the courts for a refund of the tax paid.

"It will be noted," Mr. Seidman added, "that the procedure before the Income Tax Department will be practically the same as under the old law, except that the office of the Solicitor of Internal Revenue is substituted for the Committee on Appeals and Review, which is abolished. All cases in which appeals have been made under the old law will be transferred immediately to the Solicitor's office. The Solicitor will submit his recommendations to the Commissioner, just as in the other cases, and an appeal to the Board of Tax Appeals will be permitted.

"Nothing in the new procedure will affect the present practice of permitting taxpayers to protest the results of a field examination directly to the revenue agents in charge of the taxpayers' district. Nor will the hearings at the local Collector's office be discontinued. On the other hand, whenever the return is examined in the Collector's, and a deficiency is discovered, the procedure will be the same before the Collector as before the Income Tax Department in Washington, except that all matters will be handled locally up to the point of the transfer of the case to the Solicitor's office."

## HEALTH OF THE NAVY

HEALTH conditions in general during the calendar year 1922, as indicated by the vital statistics of the Navy, were better than average in comparison with figures for the preceding five years. The death rate, 3.23 per 1,000 of total personnel, is the lowest death rate the Navy has ever had. The death rate in 1913, 3.82 per 1,000 of total personnel, is the lowest death rate the Navy has ever had. The death rate in 1913, 3.82 per 1,000, is the only one since statistics were first recorded for the Navy in 1850 that closely approximates this figure. This low rate is particularly gratifying because accident hazards, including those introduced by aviation, have multiplied and become more serious in recent years.

There were fewer admissions to the sick list for all causes per 1,000 of personnel than in recent years. Thus the downward trend in the general morbidity rate which began in 1921 was followed by a further reduction in 1922. The total number of sick days was 1,395,543, making an average of 11.4 days per person during the year. The daily average was 3,823 persons on the sick list; in other words, 3.1 per cent of the personnel constantly sick. These figures represent progressive improvement compared with conditions in 1921 and 1920.

Among classified causes of morbidity, venereal diseases again occupied first position by displacing diseases of the respiratory system, which dropped into second place for the first time since the pandemic of influenza in 1918. After diseases of the respiratory system, which include common colds, bronchitis, and tonsilitis, came the important communicable diseases that are transmissible through personal contact and secretions from the mouth and nose. These include the prevalent infections, influenza, mumps and measles. Accidents and injuries stood fourth on the list, followed by diseases of the digestive system. These five leading groups were responsible, as usual, for more than two-thirds of all admissions to the sick list, and they caused 57.5 per cent of the time lost to the service on account of morbidity and accidents. —*Annual Report for fiscal year* 1923, *Surgeon General, U. S. N.*

## BABIES ARE SAFER IN ENGLAND

ONLY 69 out of every 1,000 babies born in England and Wales in 1923 died before reaching their first birthday. This is the lowest infant mortality rate recorded in the history of the country. The London rate was only 60. In the United States the provisional infant mortality rate for 1923 was 77, and for New York City, 67.—*Bulletin of the U. S. Children's Bureau.*

## ADJUSTED COMPENSATION FOR VETERANS OF THE WORLD WAR

THE World War Adjusted Compensation Act which became a law on May 19, 1924, provides for an adjustment in pay for veterans of the World War of $1.00 a day for each day of home service and $1.25 a day for each day of oversea service, after April 5, 1917, and before July 1, 1919, except that no credit is allowed for sixty days of service or less (See paragraph 11, below) and there are classes of service, described hereafter, for which credit is not allowed. If the amount due the veteran in such adjusted compensation is $50 or less, he will be paid in cash in one payment, or, if the veteran is deceased, the amount will be paid to his dependents. If the amount due is more than $50 the veteran will receive an Adjusted Service Certificate, or, if the veteran is deceased, the

amount of the veteran's adjusted service credit will be paid to his dependent or dependents, who have made valid application within the prescribed period in the order named in the law (See paragraph 2, below) in cash in ten quarterly installments. The Adjusted Service Certificate will be in the nature of twenty-year endowment insurance, payable to the veteran in cash at the end of the twenty-year period or to the beneficiary designated by him, or to his estate in the event of his death within the twenty-year period. This certificate will be of a face value equal to the amount in dollars of twenty-year endowment insurance, that the amount of his adjusted service credit increased by twenty-five per centum would purchase at his age on his birthday nearest the date of the certificate.

The following information concerning the rights of individuals under the Adjusted Compensation Act is published for the information and guidance of all ex-service men and women and their dependents:

WHO MAY MAKE APPLICATION

1. The term "veteran" includes any individual, a member of the military or naval forces of the United States at any time after April 5, 1917, and before November 12, 1918, but does not include

(1) Any individual at any time during such period or thereafter separated from such forces under other than honorable conditions.
(2) Any conscientious objector who performed no military duty whatever or refused to wear the uniform, or
(3) Any alien at any time during such period or thereafter discharged from the military or naval forces on account of his alienage.

Any person who is a veteran as defined above and who was in active service after April 5, 1917, and before July 1, 1919, for more than sixty days and whose service was not composed entirely of those classes of service listed in Paragraph 15 of this pamphlet (for which no credit is allowed) is entitled to make application.

2. Certain dependents of deceased veterans who, had they lived, would have been entitled to adjusted compensation, may also make application. However, such dependents will not receive Adjusted Service Certificates but will receive only an amount equal to the veteran's actual service credit. Payments to the following dependents will be made in the following in order of preference:

(1) To the widow or widower if unmarried:
(2) If no unmarried widow or widower, then to the children, share and share alike:
(3) If no unmarried widow or widower, or children, then to the mother:
(4) If no unmarried widow or widower, or children or mother, then to the father.

Any of the persons above described may make application for the benefits to which they may be entitled, whether their interest be vested or contingent.

3. No payments shall be made to any individual above mentioned unless at the time of the death of the veteran such individual was dependent. For the purpose of showing dependency, a child of a veteran shall be presumed to have been dependent upon him at the time of his death, if at such time the child was under eighteen years of age. The widow or widower shall be presumed to have been dependent upon the veteran upon showing by them respectively the marital cohabitation. The father and mother, respectively, shall submit under oath a statement of dependency to be filed with the application.

WHEN TO APPLY

4. Application must be made by the veteran or dependent on or before January 1, 1928, except that in case a veteran dies during the six months immediately preceding January 1, 1928, application may be made by his dependents at any time within six months after the date of his death.

5. Application for benefits under this Act whether vested or contingent should be made by the dependents of the veteran on or before January 1, 1928. Payment will only be made to dependents who have made application in accordance with the provisions herein set forth.

6. If a veteran is entitled to an adjusted service certificate, he should fill out his application blank and send it in promptly, because in case of death before making application only the amount of adjusted service credit will be payable to the dependent instead of the face value of the certificate.

WHERE TO APPLY

7. Application should be made by the veteran or the dependent, to the Secretary of War if the veteran is serving in or his last service was with the military forces; or the Secretary of the Navy if he is serving in or his last service was with the naval forces. Such applications should be sent in care of the following offices dependent upon the branch of service in which the veteran is serving or last served;

For the Army, send application to:
Adjusted Compensation Branch
The Adjutant General's Office,
Washington, D. C.

For the Navy and Coast Guard, send application to:
Adjusted Compensation Branch,
Bureau of Navigation,
Washington, D. C.

For the Marine Corps, send application to:
Adjusted Compensation Branch,
U. S. Marine Corps,
Washington, D. C.

8. In no case should any application be sent to the United States Veterans' Bureau.

HOW TO APPLY

9. Application must be made personally by the veteran or dependent; or in case of physical or mental incapacity, by his or her representative in accordance with the instructions furnished with the application.

10. Application blanks are furnished for this purpose, these blanks may be obtained from:

Any post of the American Legion, Veterans of Foreign Wars, Disabled American Veterans, any chapter of the American Red Cross, all agencies or stations of the Army, Navy, Marine Corps or Veterans' Bureau, U. S. Military attaches or legations in foreign countries and every Post Office in the United States and its possessions. Other details relating to adjusted service credit and other matters may be secured by application to either of the departments specified above.

## AMERICAN ORTHOPSYCHIATRIC ASSOCIATION

At the first annual meeting of the American Orthopsychiatric Association held at the Institute for Juvenile Research, Chicago, on June 10, the following officers were elected: *President,* Dr. William Healy, Boston; *vice-president,* Dr. Arnold L. Jacoby, Detroit, and *secretary-treasurer,* Dr. Karl A. Menninger, Topeka, Kans. Among the speakers were Drs. Douglas A. Thom, Boston; David M. Levy, Chicago, and Bernard Glueck and Victor V. Anderson, of New York. The association was organized to study crime and other conduct disorders from a psychologic standpoint. Active membership is limited to psychiatrists engaged directly in the study and treatment of behavior disorder.—*Science.*

## THE SPREAD OF SMALLPOX

Pittsburg has been invaded by a serious type of smallpox. Out of 52 cases there have been 11 deaths. The antivaccinationists can no longer claim that smallpox is not a serious menace. Health authorities have always recognized the probability of recurrence of malignant types. Let us protect Massachusetts with laws requiring vaccination of children in private schools.

## OBITUARY

### ROBERT WILLIAMSON LOVETT, M. D.

Robert Williamson Lovett was born in Beverly, November 18, 1859, the son of John Dyson, a Boston merchant, and Mary Elizabeth (Williamson) Lovett. He prepared for college in Noble's School and graduated from Harvard in the class of 1881 and from the Harvard Medical School in 1885. He served as House Officer at the Boston City Hospital for eighteen months and then became Assistant Surgeon for a brief period at the New York Orthopedic Hospital.

Returning to Boston he entered active practice in 1886. He was appointed Surgeon to Out Patients at the Boston City Hospital and at the Carney Hospital, Assistant Out Patient Surgeon to the Children's Hospital and Surgeon to the Infants' Hospital and the House of the Good Samaritan. He was Assistant in Clinical Surgery in the Harvard Medical School for five years. He resigned from the Carney Hospital and in 1901 from the City Hospital to devote his attentions exclusively to orthopedic surgery. He was appointed assistant in orthopedics in 1902 and was advanced through the various grades until he became the John B. and Buchminster Brown Professor of Orthopedic Surgery in Harvard. There was a corresponding advancement at the Boston Children's Hospital to the position of Visiting Surgeon which he held up to his retirement from active service two years ago. He also became Surgeon in Chief to the Massachusetts Hospital School at Canton and to the Peabody Home for Crippled Children which from small beginnings has grown into the splendid institution in the Oak Hill section of Newton.

For some time before its reörganization in 1914 he was a member of the Massachusetts State Board of Health, serving as a valued adviser to its Chairman, Dr. Henry P. Walcott, to whom the Commonwealth owes so much.

Since 1914 Dr. Lovett has had charge of the work done by Vermont for the victims of infantile paralysis. In 1916 he was appointed consulting orthopedic surgeon to the New York State Department of Health, acting as adviser in cases of infantile paralysis occurring in New York State outside of the City of New York.

He also served as Consulting Surgeon to the Boston Dispensary.

In 1916 he became Chairman of the Harvard Infantile Paralysis Commission and since that time has directed the care of the patients coming under the charge of that body.

During the war he was a member of the Advisory Board on Orthopedics of the United States Army, serving with the rank of Major. He gave intensive instruction in Boston and Washington to about three hundred and fifty officers of the Medical Corps destined for overseas work.

In 1920 the University of Cincinnati, in recognition of his work, conferred upon him the Honorary Degree of Doctor of Science.

On October 8, 1895, he married Elizabeth Morfew Storey, the daughter of a leader of the Boston Bar. Though there had been warnings of serious disease for some time he was looking forward to a restful summer in England with his wife. Taken ill on the steamer he was carried to the home of Sir Robert Jones in Liverpool where he died of anaemia on July 2, 1924.

Such is a brief chronological account of some

events in the life of a man who through his interest in orthopedic surgery and by force of his personality became one of the most widely known men in his specialty and attracted from far and wide patients who became devoted friends.

As an undergraduate at Harvard he showed interest in Natural History and delivered a Commencement part on the Development of the Senses.

Among his classmates in College there were many who have won distinction in medicine: Algernon Coolidge, Garry de N. Hough, Herbert B. Howard, J. S. Howe, Edward B. Lane, John C. Munro, William Noyes, Edward Reynolds, W. D. Swan, C. W. Townsend, and from outside of Massachusetts, John K. Mitchell and C. B. Penrose of Philadelphia, George K. Swinburne and E. J. Ware of New York, Ambrose Talbot of Kansas City, DeLancy Rocheshi of Buffalo and Addison S. Thayer of Portland.

As House Officer at the Boston City Hospital the influence of Cheever, Gay, Post, Bradford and Burrell must have been an inspiration.

The early interest Dr. Lovett showed in orthopedic surgery was stimulated in New York by association with Drs. H. L. Taylor and N. M. Shaffer with both of whom he wrote early papers dealing with bone tuberculosis. On returning to Boston he wrote a paper upon Diseases of the Joints with Dr. E. H. Bradford. Bradford, Post and Burrell of the City Hosptal and A. T. Cabot and John Homans of the Massachusetts General Hospital were all interested in the development of the new Children's Hospital and gave a stimulus to Orthopedic Surgery in which Dr. Lovett became so much interested and to which he devoted so much of his life.

In 1890 the first edition of the Treatise on Orthopedic Surgery by Bradford and Lovett appeared. One noteworthy statement appears in the preface of this book written in 1889—"The term Orthopedic Surgery, if it is properly defined, should include the prevention as well as the cure of deformity."

The progress in Orthopedic Surgery in the last third of a century as well as the extension of the field of this specialty is shown by contrasting this first edition of the textbook of Bradford and Lovett with the work on Orthopedic Surgery by Sir Robert Jones and Dr. Lovett published in 1923. The estimate placed upon Dr. Lovett by his colleagues is shown by his membership in the American, British, Italian, and German Orthopedic Associations and in the International Surgical Society. In 1897-8 he was President of the American Orthopedic Association of which he was one of the founders. He was also active in the formation of the Orthopedic Section of the American Medical Association.

In addition to the two textbooks mentioned Dr. Lovett was the author of nearly a hundred papers upon various subjects dealing with orthopedics. It is interesting to note one early paper upon an experimental investigation of strychnine poisoning which was conducted in the physiological laboratory of Dr. H. P. Bowditch. In the most part the earlier papers dealt with tuberculosis of bones and joints. There followed many papers upon static disturbances of the feet and later upon spinal curvatures. After 1912 most of his interest lay in infantile paralysis.

Among the more important contributions are the Fiske Prize Essay on Diseases of the Hip published in 1891, the article in Park's Surgery on Orthopedics published in 1896, the articles on Orthopedic Surgery and Diseases of the Joints in Keen's Surgery in 1907 and monographs on Lateral Curvature and Round Shoulders and on the Treatment of Infantile Paralysis.

In the course of his busy life which carried him widely afield in this country and Europe he found time for many local activities. He served as councillor of the Massachusetts Medical Society, he was President of the Boston Surgical Society, and was a member of the Boston Orthopedic Club. Membership in the Puritan, Tavern, Somerset, and Harvard Clubs in Boston and in the University Club of New York and the Cosmos Club in Washington show his wide interests. The JOURNAL will greatly miss his interest as a member of the Editorial Staff. He will be missed too in that small group who for many years have at their dinners discussed and planned policies for the Harvard Medical School.

His interest in the School made him the first Secretary of the Harvard Medical Alumni Association a few years after he graduated. This interest in the School and in Medical Education constantly grew as the teaching and development of Orthopedic Surgery absorbed his attention. The development of the Children's Hospital, in its intimate relation to the Harvard Medical School, owes much to him. To him chiefly is due the great development of the Peabody Home.

The growing responsibilities of teaching and the experiences of instructing practitioners during the War led him to publish an important article in 1919 on Suggestions for the Improvement of Medical Education. He became one of the powerful members of the Faculty of the Medical School whose counsel carried great weight.

Clearness of thought and simplicity of expression made him a great teacher. Students appreciated his ability to give clearly the reasons for diagnosis and for treatment. And many a student looks back with mingled pleasure and dismay at his facility in formulating problems to be worked out.

The public will miss a man who devoted great attention to a scourge the cause of which is as yet undetermined. His patients will miss one upon whom they had come to depend not only as a physician but as a friend. The Medical School and the Medical Profession will miss a great teacher and great organizer who by the force of his personality had done much to advance Orthopedic Surgery.